The RUBBER AGE

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Late News of the Rubber Industry

Rubber Institute Passes Into History Through Merger With Rubber Association

BY a formal statement issued jointly by General Lincoln C. Andrews, director general of the Rubber Institute, Inc., and A. L. Viles, general manager of the Rubber Association of America, Inc., it has been announced that special meetings of the respective members of the two organizations have been called for May 10, at the Hotel Plaza, New York City, at which each organization will take simultaneous action looking toward a consolidation of the two institutions into a new co-operative association of the rubber manufacturers throughout the entire industry. The chief feature of the new organization will be that the membership will be strictly confined to manufacturers of rubber products and will not include reclaimers or crude rubber dealers and brokers. This feature is incorporated in the name of the new organization, which will be known as the Rubber Manufacturers Association.

The consolidation of the Rubber Association and the Institute was recommended last January by General Andrews, in the belief that the purposes of the Institute and the work of the Association would be thus served more efficiently and economically than by continuing further the operation of the two institutions separately. With the passing of the Institute, General Andrews retires from further official connection with the rubber industry.

The new organization will mean a considerable loss in the membership from the Rubber Association which has heretofore included a larger number of crude rubber dealers and brokers, reclaimers and scrap rubber dealers. On the other hand, the merger will bring into the re-named Association several manufacturing units which have in the past been members of the Institute alone. The Rubber Association has been the leading trade organization of the rubber industry in the United States for the last twenty-nine years, an organization with much to its credit in the way of practical accomplishment and one which has gone far in its co-operative efforts among its members. It was founded in 1900 at Boston and was then known as the New England Rubber Club. It expanded in 1909 and was incorporated under the laws of Massachusetts as the Rubber Club of America. In 1917 it again branched out in its activities and the name changed to the Rubber Association of America. The history of the Association during the years of the World War is an extremely honorable one and it played an important part in consolidating and co-ordinating the work of manufacturing war supplies.

The Rubber Institute is scarcely a year old and was launched in New York with considerable enthusiasm at a time when it was believed that a greater degree of co-operation among the manufacturers could be secured by this new body directed by General Andrews than through the older Association. The salient accomplishment of the Institute was the establishment of the now famous standard tire warranty. Whether this warranty has worked out successfully or not is questionable. The only apparent result of it was to wipe out all definite mileage guarantees and substitute various other pledges of quality and endurance. "Bonded," "Insured," and "Registered" tires have merely taken the place of specific mileage guarantees.

The Institute also made what now appears to have been a futile attempt at formulating and securing through the Federal Trade Commission, the universal adoption of a code of ethical business practices for the industry. It is known that such a code of trade practice was drawn up and distributed to the members of the Institute but no decision looking toward their adoption has been made. All of this work seems to have gone into the discard and with only the "ephemeral" standard tire warranty to its credit it would seem that the Institute has gone as far as it can alone and has not come up to the expectations of its sponsors. The Insitute's program for putting an end to "profitless prosperity" by means of "co-operation in competition" has apparently failed. On the other hand, its original purpose in seeking to correct unsound merchandising practices among the manufacturers is still a worthy one and will probably be "followed through" by the new organization.

At this time just what will become of the palatial suite of offices now maintained by the Institute on the twenty-second floor of 1776 Broadway, New York City, is not known. Nor are the exact plans of the new organization and the names of its officers available for publication. In view of the fact that THE RUBBER AGE comes out on the day of the special meetings called to effect the consolidation, full details as to the results of the merger will be published in the issue of May 25.

Toledo Rubber Firm Plans To Move to Muscle Shoals

SHAREHOLDERS of the Maumee Valley Rubber Company, Inc., Toledo, O., manufacturer of marbleized rubber tiling, were scheduled to vote on May 4 on a proposal to merge with the Rubber Corporation of Alabama to form a new $200,000 corporation. Under the

projected consolidation, most of the manufacturing operations would be centered in the plant of the Alabama unit at Muscle Shoals, where cheap labor and power are available. Officials of the company have declared that Toledo has become a center for distribution and sales for the products made by the company and that the plant in that city will be retained for that purpose.

The plan of merger provides for a share for share exchange of stock. It is reported that considerable Detroit capital is already invested in the Alabama company.

The Maumee Valley Rubber Company was originally incorporated in August, 1926, with a capital of $75,000 to reclaim, manufacture and sell rubber goods, particularly repair materials and floor tiling. The incorporators were S. F. Novak, John Geenwood, C. J. Neithammer, Arthur Pieper and Henry Hennaman. At the present time, the officers include E. L. McKimm, president; W. O. Reid, vice-president; D. A. Gilmore, secretary; and P. H. O'Brien, treasurer.

Automotive Parts Industry Busy During March and April

MANUFACTURERS and wholesalers of automotive parts, accessories and garage equipment had a March business of unparalleled proportions and closed the first quarter of 1929 at levels far in excess of any similar period in the history of the industry, according to the Motor and Equipment Association.

Led by the suppliers of units and parts to the car and truck manufacturers for original equipment, with a tremendous gain over February, manufacturers selling parts, accessories and garage equipment to the wholesale trade also had a volume of business in the first quarter well in excess of previous months this year and, except for accessory sales, better than the same period last year.

With March generally regarded as the peak month, a gradual recession is looked for as a normal course of events during the second quarter but the orderly slowing up will start from such a high level that business is virtually certain to exceed last year up to the mid-year period at least. Early reports for April, in fact, showed heavy operations being maintained by a large number of manufacturers.

Aggregate shipments in March of parts, accessories and garage equipment manufacturers to both vehicle makers and the wholesale trade reached an index figure of 241 per cent of the January, 1925, base which is 100, as compared with 212 in February, 188 in January and 207 in March last year.

Goodyear Buys Old Akron Factory Of Kelly-Springfield Company

PURCHASE of the old plant of the Kelly-Spingfield Tire Company at Akron, O., by the Goodyear Tire & Rubber Company has been completed, according to a statement by P. W. Litchfield, president of the latter firm. The plant was bought because of its convenient position between plants No. 1 and No. 2 of Goodyear, but no announcement has as yet been made as to what use will be made of the acquisition.

Actual transfer of the property will not take place for a short time, it was reported, as minor details of the purchase are yet to be worked out. Negotiations have been in progress for a long time and came to a head at a meeting during the last week in April.

The Kelly-Springfield Tire Company left Akron several years ago and moved to Cumberland, Md., where many inducements were offered to the organization by local business men. The Goodyear property at present practically encircles the old Kelly-Springfield plant on Kelly Avenue, and lack of room for expansion was one of the factors in Kelly officials deciding to move. All the equipment left in the Kelly plant when operations were moved to Cumberland were taken over by the Akron Industrial Salvage Company.

Several reports on the use to which the property will be put by Goodyear were given in local newspapers, but the one believed most credible was that a huge warehouse would be built. The property is bounded by the Goodyear storage reservoir on the east, Second Avenue on the north, and the railroad tracks on the south and east. Goodyear plant No. 1 is directly across the street from the Kelly property on Second Avenue.

United States Rubber Exports Are Heavy in First Quarter

EXPORTS of rubber tires and other rubber products from the United States during the first three months of 1929 were at unusually high levels, shipments of pneumatic casings alone amounting to nearly a million with a value in excess of $11,000,000. For the first quarter of the current year, Belgium displaced Brazil as the second American tire market, ranking just below Argentina, and during the month of February was in first place.

Exports of truck and bus casings 6 inches in size or over totaled 83,561 for the first quarter with a value of $2,105,392, while all other pneumatic casings shipped aggregated 866,401 with a value of $9,046,695. Shipments of inner tubes totaled 646,895, valued at $1,154,592, and solid automobile and truck tires reached a total of 15,199 with a value of $473,869. Argentina ranked as our first export customer in every one of these classes.

During the month of March, Czechoslovakia took first place in exports of truck and bus casings 6 inches in size or over, but Argentina was the leader for all other automobile casings, 27,958 being consigned to that country with a value of $215,144. Belgium was the second customer in importance, receiving 22,199 casings worth $214,794, and Denmark and Brazil were in third and fourth places, respectively.

Export shipments of rubber footwear were also high in March, canvas rubber-soled shoes totaling 746,478 pairs with a value of $508,176. Cuba was the principal market for this item, taking 179,629 pairs with a value of $107,309. Exports of rubber boots totaled $177,107 in value and rubber shoes $157,861. Shipments of rubber heels were worth $121,420 and rubber soles $29,711, with Canada our leading customer for each.

In March, 3,010,888 pounds of reclaimed rubber were shipped out of the United States with a value of $205,759, and 4,789,924 pounds of scrap rubber valued at $228,586. Canada was our chief market for reclaimed rubber and France for scrap and old rubber.

Bankruptcy Application Denied Against Murray Rubber Company

THE application of the U. S. Rubber Reclaiming Company for the appointment of a receiver for the Murray Rubber Company, Trenton, N. J., was denied last month by Vice-Chancellor Bentley at Jersey City. The complainant had alleged that the Murray company was insolvent and that its assets stood at $500,000 against liabilities in excess of $1,250,000, aside from obligations to stockholders. It was further claimed by the complainant that the company had suspended business operation.

G. Edward Murray, Jr., president of the Murray Rubber Company, immediately announced after the filing of the petition that his firm had retained counsel and would fight the suit. "The complaint of the U. S. Rubber Reclaiming Company against the Murray Rubber Company, as reported to the press," he stated, "is caused by a dispute about contracts which were made in 1925. The assets are and have been at least $1,000,000 in excess of liabilities, and the current assets over current liabilities have recently been increased nearly a million dollars by the acquisition of additional funds to open 1,000 chain stores throughout the country. The plant has not been shut down. On the other hand, business has been increasing and the company has not at any time been insolvent."

The court sustained his claims in denying the application and found that the company's current assets are approximately $1,000,000, while the liabilities total only one-fifth of that amount.

Final Steps Taken for Lambert-Raritan Merger

AFFAIRS of the Lambert Tire & Rubber Company, Akron, O., which have been in the courts since the merger with Raritan Rubber, Inc., New Brunswick, N. J., manufacturers of solid and cushion truck tires, will reach a settlement in the near future as the result of a new plan of reorganization. The plan was approved last month at a meeting of creditors of the Lambert organization as the final step in the receivership that followed the consolidation of the two companies in January.

An order of sale has been issued by Harry L. Snyder, federal referee in bankruptcy, at whose office the creditors' meeting was held, and the land, plant and equipment will be sold by J. W. Dessecker, trustee, at a private sale. Under the reorganization plan, the Ohio corporation of the Lambert company will buy the plant from the Lambert Tire & Rubber Company, an Arizona corporation which has been acting in the capacity of a holding company. The factory has been in operation throughout the bankruptcy proceedings and its operations will in no way be affected by the sale.

Creditors who have signed up under the reorganization plan will receive notes for the full amount of their claims. Present note holders of the company will receive preferred stock in the new company for the full amount of their claims. Creditors and note holders who have not come into the reorganization scheme will be paid on a pro rata basis. Liabilities of the company are listed as about $585,000 and assets at about $385,000, and the amount the creditors not in the reorganization scheme receive will depend on the amount realized by the sale of the corporation.

The first announcement of the merger with Raritan Rubber, Inc., was made on January 8, when the common capital stock of the Lambert Tire & Rubber Company of Ohio was increased to the extent of $200,000 and the preferred stock to the extent of $128,000. The plant of the Raritan firm was moved to Akron at that time. At that time the reorganization committee filed a petition in common pleas court, asking for the appointment of a receiver for the Arizona corporation in what was termed a friendly receivership, and J. W. Dessecker was appointed receiver. The tire firm was named in the petition by the Akron Standard Mold Company, the Akron Engraving Company, and the Herberich-Hall-Harter Company, listing their claims as $16,000, $125 and $500, respectively.

An order was issued on March 22 for the sale of the company's property by Cletus Roetzel, special master commissioner, and preparations were made for the sale to take place five days later, but this state bankruptcy action was superseded by the filing of a new petition for a bankruptcy sale in the federal court at Cleveland. The present order for the sale was issued in federal court last month.

The officers of the Lambert Tire & Rubber Company under the merger are G. W. Seiberling, president; J. P. Seiberling, vice-president; J. W. Dessecker, secretary and treasurer; G. W. Seiberling, J. P. Seiberling, G. W. Merz, William A. Boesche and J. W. Coyle, directors. Alfred Foster, president of Raritan Rubber, Inc., has joined the organization as manager of truck tire sales.

Fidelity Tire & Rubber Earned $84,314 in 1928

SHOWING a consistent growth, the Fidelity Tire & Rubber Company, Warren, O., reports for 1928 a net income of $84,314 after depreciation, interest and federal taxes. These earnings are equal to $2.11 a share on 30,000 shares of common stock after allowing for the full year's dividends on the preferred stock. This compares with 1927 earnings of $72,087 after depreciation but before interest and federal taxes.

Net sales of the Fidelity Tire & Rubber Company in the year ended December 31, 1928, were $1,672,669 as compared with sales in 1927 amounting to $1,339,225, an increase of approximately 24.9 per cent despite lower unit prices. The company's balance sheet as of January 1 showed current assets of $552,270 and current liabilities of $130,653, a current ratio of 4.22 to 1. A pro forma balance sheet as of September 30, 1928, after giving effect to refinancing, showed current assets of $586,254 and current liabilities of $171,296, a current ratio of 3.42 to 1.

A group of Chicago business men, headed by Edward M. Bertha, who became president, took over the tire plant three years ago, and earnings have shown an increase since that time. Mr. Bertha recently stated that company officials expected 1929 profit to exceed that of last year considerably.

An issue of $300,000-7 per cent cumulative preferred stock was privately placed in recent months by Paul H. Davis & Company. This stock carried with it common stock, share for share, and the right of conversion into common at the rate of four shares of the latter for each share of preferred. In addition to the preferred shares, the capital account consists of $250,000 first mortgage bonds and approximately 30,000 shares of $5 par value common stock. The common stock has been listed on the Chicago Curb Exchange.

Bondholders Ask for Sale of Chillicothe Rubber Company

SALE of the Chillicothe Tire & Rubber Company's building, machinery and equipment at public auction is asked by John P. Phillips, Sr., in a cross-petition and answer to the recent suit brought by T. Ewing Arganbright against the company, its trustees and lienholders for the collection of $3,908.90, due on delinquent real estate tax and penalties. Arganbright also asked that the property at Chillicothe, O., be sold to satisfy the tax claim.

Mr. Phillips claims that he holds notes issued by the company on November 17, 1921, and claims that the amount due him on the principal and interest of the notes to March 17, 1929, is $38,267.47 with interest from that date at the rate of 8 per cent. He claims to have the first and best lien against the property and asks that the proceeds of the sale requested be applied on his claim. Both his cross-petition and answer and the answer of the company admit that Mr. Arganbright has a claim against the property for taxes, but deny that it is in the amount stated.

R. B. Mutchler, trustee of mortgage bonds issued by the

company on February 12, 1924, the mortgage being made subject to the mortgage already held by Addison P. Minshall, trustee and his assignee, John P. Phillips, asserted in his answer that on the bonds over which he is trustee there is due the sum of $33,860.36 with interest at 7 per cent from February 12, 1924. Mr. Mutchler asks the court to protect his interests as trustee.

The company's answer asks that the pretended lien of Milan D. Wilson, a defendant in the case against the property, be set aside. Walter W. Boulger is attorney for Mr. Mutchler, Mr. Phillips and the Chillicothe Tire & Rubber Company. All outstanding notes and interest are unpaid, the answers indicate, and are due for payment. The company's answer admits the allegations of Mr. Phillips' cross-petition and the statements of Mr. Mutchler's answer.

Treasurer Arganbright also has a suit against the company to recover delinquent personal tax amounting to $1,695.12.

Davis Begins Reorganizing of United States Rubber Company

DIRECTORS of the United States Rubber Company, in which the large interests of the du Ponts are believed to have been asserting themselves recently, held an important meeting April 23, and several sweeping changes in the management were made. The most significant step taken was the dropping of the former system of centralized control in favor an organization of separate divisions such as exists in the General Motors Corporation.

Reports that John J. Raskob, former chairman of the finance committee of General Motors and a close associate of the du Ponts, would join the directorate of United States Rubber to assume a similar position in charge of financial affairs were not borne out. F. B. Davis, Jr., chairman of the board and president, was chosen to act as head of the finance committee, whose members now include James S. Alexander, Henry Davis and Sir William Wiseman, a partner of Kuhn, Loeb & Company. The finance committee was formerly composed of Mr. Alexander, J. B. Ford, W. S. Ballou, Nicholas F. Brady and Charles B. Seger.

Members of the executive committee now include F. B. Davis, Jr., chairman; Edward J. Coughlin, William O. Cutter, Ernest Hopkinson, Herbert E. Smith and Lucius D. Tompkins. The list of officers for the current year comprises F. B. Davis, Jr., chairman of the board and president; Edward J. Coughlin, William O. Cutter, Ernest Hopkinson, Herbert E. Smith, Lucius D. Tompkins, vice-presidents; Wilson H. Blackwell, treasurer; Eric Burkman, secretary; John W. Davis, general counsel; Paul H. Arthur, general attorney; and Arthur Surkamp, comptroller.

In addition to the shift to a divisional organization, several steps have been taken under the leadership of President Davis toward economy of operation and efficiency of personnel. A program of closing down and disposing of plants which have been operating without profit was instituted early in March with the discontinuance of operations at the L. Candee & Company factory at New Haven, Conn., and plant No. 2 of the Boston Rubber Shoe Company at Melrose, Mass., as reported previously in THE RUBBER AGE. The most recent step taken was the decision last month to sell the office and plant of the India Rubber Company at New Brunswick, N. J., where the annual meetings of the company had been held for many years. This rubber boot and shoe factory had been closed for some time prior to the present reorganization movement.

In the closing down of the two plants this year, every effort was put forth to protect the interests of the 300 workers at Melrose and the 900 at the Candee factory.

Steps have been taken to make for greater efficiency in all departments. All branches operating as Goodyear's I. R. Selling Company, Cady Ivison Shoe Company, Marion Rubber Company, Detroit, and Marion Rubber Company, Grand Rapids, will be operated in the future as Goodyear Glove Rubber Company, Inc. The United States Rubber Export Company, Ltd., has perfected plans for extending its work and has announced the following organization: Herbert E. Smith, president; Charles E. Guest, vice-president and general manager; William L. Proctor, treasurer; Edwin B. Hopkinson, director footwear sales; John B. Tower, director tire sales; and Ralph V. Hilands, director mechanical sales.

L. M. Simpson, only recently stationed at New York as assistant to Vice-President Tompkins, has been appointed general sales manager of the tire department. Mr. Simpson has spent eight of his ten years with the company on the Pacific coast, acting successfully as a department manager at Los Angeles, branch manager at Sacramento, Butte, Great Falls, Salt Lake City, Utah, and Portland. Then he was engaged for two years as central manager of tire sales with headquarters at Detroit.

L. M. SIMPSON

Harry H. Reifenstein has been appointed general manager of clothing sales, his appointment following closely upon his completion of 25 years of service with the company. He has been acting as assistant manager of clothing sales since 1924.

The following department heads were recently appointed under the new divisional line-up:

Tire Department—General Manager, L. D. Tompkins.

Footwear Department—General Manager, T. J. Needham; Assistant General Manager, H. S. Marlor.

Mechanical Department—General Manager, Walter Gussenhoven; Assistant General Manager, W. C. Bowker.

Clothing Department—General Manager, George E. Goodwin; Assistant General Manager, G. S. Woodward.

Sundries Department—General Manager, H. W. Waite; Assistant General Manager, C. A. Blake.

Rubber Regenrating Company—President, E. A. Andersen.

Naugatuck Chemical Company—General Manager, Elmer Roberts.

Dominion Rubber Company, Ltd.—President, W. A. Eden; Vice-President, G. W. Charles.

Distributing Districts—General Manager, Herbert E. Smith; Assistant General Manager, F. W. Strong.

Export Company—President, Herbert E. Smith; General Manager, Charles E. Guest.

General Rubber Company—President, L. D. Tompkins; Vice-President, John Donaldson.

Rubber Plantations—President, H. S. Hotchkiss; Vice-President, Don E. Andrews; Managing Director, J. W. Bicknell.

For the General Service Departments the following appointments were announced:

Finance and Accounts—Vice-President, W. O. Cutter; Treasurer, W. H. Blackwell; Comptroller, Arthur Surkamp.

Planning and Engineering—Director, E. O. Upham; Assistant Director, H. F. Newell.

Development—Director, Ernest Hopkinson; Manager, W. A. Gibbons; Assistant Manager, N. A. Madge.

Industrial and Public Relations—Director, C. S. Ching.

Commercial Research—Director, Walter Emery.

Advertising—Director, William F. Earls.

Purchasing—General Purchasing Agent, William H. Marsh; Assistant General Purchasing Agent, George M. Tisdale.

Traffic—General Traffic Manager, George F. Hichborn.

Legal and Patent—General Attorney, P. H. Arthur; Patent Attorney, W. L. Pipes.

W. O. CUTTER

E. J. COUGHLIN

H. E. SMITH

L. D. TOMPKINS

President Davis Describes Plans for U. S. Rubber Reorganization

E. HOPKINSON

F. B. DAVIS

SINCE my election as president of the United States Rubber Company, I have given much careful thought, in coliaboration with members of the organization, to those problems of the company which appeared to require prompt attention, of which I conceive the problem of organization to be most urgent, lying as it does at the very foundation of all concerted action necessary to realize that large measure of success which I believe the company can and ought to achieve.

Broadly, the new plan of organization involves changing the system of centralized control which has existed heretofore into one in which the company's business is divided into separate departments or companies, each directed and operated by a general manager—or a president in the case of a subsidiary operating under its own name—who will have control and absolute responsibility for all of the operations of his department. The departments are established along the lines of commodities or groups of commodities having common characteristics of manufacture or distribution, as follows:

TIRE
Pneumatic tires and tubes; solids and cushion; bicycle and motorcycle tires and tubes; airplane tires and tubes; tire accessories.

FOOTWEAR
Waterproof; Keds; house slippers; felt goods; leather shoes.

MECHANICAL GOODS
Belting; hose and packing; moulded and miscellaneous goods; wire and tape; mats and matting; interlocking tiling; jar rings.

SUNDRIES
Golf balls; thread, card cloth; hard rubber; bathing accessories; druggists' goods; flooring; soles and heels.

CLOTHING
Waterproof clothing; Naugahyde specialties; carriage and auto topping.

RUBBER REGENERATING COMPANY
Reclaimed rubber.

NAUGATUCK CHEMICAL COMPANY
Heavy acids; Lotol (latex composition); accelerators; antioxidants; other chemicals.

DOMINION RUBBER COMPANY, LTD., CANADA
Waterproof footwear; tennis footwear; felt footwear; mechanical goods; sundries; tires and tubes.

GENERAL RUBBER COMPANY
Sprayed rubber; liquid latex; crepe, smoked sheet and other market grades.

UNITED STATES RUBBER PLANTATIONS, INC.
Ten estates in British Malaya and Sumatra, D. E. I., comprising 135,100 acres owned, 88,500 acres planted, and 59,000 acres mature.

DISTRIBUTING DISTRICTS
Warehouses located in principal cities of the United States.

UNITED STATES RUBBER EXPORT CO., LTD.
Branches and distributors located in all countries throughout the world.

Executive Committee Is Given Broader Powers

The general manager of each department will control all of its activities, including manufacturing, selling, accounting, and research and development, and will report to the president. Each general manager is entitled to use all the general service departments of the company, and in fact will be expected to avail himself of their help to the fullest extent. These general service departments are as follows:

FINANCE AND ACCOUNTS
PLANNING AND ENGINEERING
DEVELOPMENT
INDUSTRIAL AND PUBLIC RELATIONS
COMMERCIAL RESEARCH
ADVERTISING
PURCHASING
TRAFFIC
LEGAL AND PATENT

Representing the board of directors, and advising with the president in the general administration of all of the activities of the company, are two committees, namely, the finance committee and the executive committee.

The finance committee comprises the president and members of the board of directors who, on account of special knowledge and experience, are best qualified to act in matters of corporate finance.

The executive committee is made up of those members of the organization who have heretofore been charged with the responsibility of some of the major activities of the company as it has heretofore been organized. Its function is to advise with the president in all of the operations of the company related to manufacturing, selling, and development and research, and to represent the board of directors in the supervision of the operations of the various departments.

F. B. Davis Jr.

President.

Tire Stocks Increase to

The Average Tire Dealer Held 9 on April 1, According to S

STOCKS of tires and tubes in the hands of dealers throughout the United States have been considerably increased over this time a year ago and have reached new record levels, according to the final report of the annual survey undertaken by the Department of Commerce through the Rubber Division of the Bureau of Foreign and Domestic Commerce. There continues to be a rise in the number of dealers carrying more than 100 casings, but despite this fact and the great jump in total stocks, the trend still appears to be toward concentration on the tires of a single manufacturer, nearly 60 per cent of the dealers reporting that they handle but a single make of tire.

In a preliminary report, issued by the Department of Commerce on April 12, it was indicated that the average dealer was holding 90.3 casings and 137.9 inner tubes. With added information from about 5,000 more dealers, both of these figures showed the usual increase in the final report which revealed that the average dealer had 94.4 casings and 143.5 inner tubes as of April 1. The final report for the same date last year showed the average pneumatic tire and tube stock at 81.2 and 123.4, respectively, indicating a 16 per cent increase this year.

A comparison with the survey of dealers' stocks taken last October, when the average number of casings per dealer stood at 64.8 and of inner tubes at 107.4 is not a fair one, in view of the difference in seasonal buying. Spring inventories are naturally higher than fall stocks, but it is of interest to note the tremendous jump in stocks which has taken place in the six months since October 1.

Fewer Dealers Are Reporting

While the increase in figures this year reflects the record breaking production and shipments by tire factories in recent months and indicates that most dealers are better stocked in order to handle the increased number of motor cars, it is also true that a much smaller number of dealers answered the questionnaires this year as compared with the last two years. Only 25,245 dealers responded to the current survey as against 30,974 in 1928 and 36,865 in 1927.

In the present survey for the first time, the National Tire Dealers' Association co-operated with the Rubber Division by urging its members to report, and the higher percentage of dealers who reported stocks of more than 100 casings is believed to be a result of this co-operation. In view of this fact and the large number of dealers failing to respond, the present reports, including returns from N. T. D. A. members not previously reporting, are considered by the Rubber Division to be not exactly comparable with those of April, 1928.

The analysis shows, however, that this year a smaller percentage of dealers fell into each class having 100 or less casings, with one exception, while a greater percentage of dealers fell into each class having more than 100 casings.

DEALERS' STOCKS OF TIRES BY STATES
April 1, 1929

	Total Casings			Inner Tubes		
	No. of Dealers Reporting	*No. of Tires on Hand*	*Average No. per Dealer*	*No. of Dealers Reporting*	*No. of Tubes on Hand*	*Average No. per Dealer*
New England						
Maine	422	31,539	74.7	425	49,609	116.7
New Hampshire	202	16,854	83.4	201	22,737	113.1
Vermont	175	9,325	53.3	170	15,700	92.4
Massachusetts	798	90,959	114.0	787	135,699	172.4
Rhode Island	96	7,632	79.5	94	11,713	124.6
Connecticut	240	25,335	105.6	245	33,365	136.2
Total	1,933	181,644	90.6	1,922	268,823	139.9
Middle Atlantic						
New York	1,396	156,012	111.8	1,378	228,790	166.0
New Jersey	514	73,807	143.6	504	97,363	193.2
Pennsylvania	2,222	186,096	83.8	2,176	259,451	119.2
Total	4,132	415,915	100.7	4,058	585,604	144.3
East North Central						
Ohio	1,444	141,770	98.2	1,400	194,200	138.7
Indiana	940	82,165	87.4	923	125,714	136.2
Illinois	1,280	115,025	89.9	1,225	179,235	146.3
Michigan	869	71,724	82.5	863	119,205	138.1
Wisconsin	987	92,871	94.1	972	142,602	146.7
Total	5,520	503,555	91.2	5,383	760,956	141.4
West North Central						
Minnesota	795	85,752	107.9	772	123,761	160.3
Iowa	944	75,811	80.3	931	121,829	130.9
Missouri	740	80,214	108.4	740	116,381	157.3
North Dakota	398	29,979	75.3	399	49,681	124.5
South Dakota	290	20,883	72.0	291	36,588	125.7
Nebraska	469	35,512	75.7	463	57,985	125.2
Kansas	641	54,852	85.6	621	87,657	141.2
Total	4,277	383,003	89.5	4,217	593,882	140.8
South Atlantic						
Delaware	48	3,929	81.9	45	7,274	161.6
Maryland	317	26,423	83.4	315	36,743	116.6
Dist. of Columbia	63	8,990	142.7	58	12,712	219.2
Virginia	594	32,185	54.2	585	51,567	88.2
West Virginia	335	28,662	85.6	337	41,870	124.2
North Carolina	399	45,257	113.4	388	71,968	186.0
South Carolina	243	13,454	55.4	246	26,732	108.7
Georgia	307	28,179	91.8	308	46,490	150.9
Florida	283	41,464	146.5	283	54,029	190.9
Total	2,589	228,543	88.3	2,565	349,385	136.2
East South Central						
Kentucky	318	28,418	89.4	312	46,224	148.2
Tennessee	243	29,464	121.3	245	44,567	181.9
Alabama	286	26,749	93.5	280	42,957	153.4
Mississippi	288	22,199	77.1	283	43,644	154.2
Total	1,135	106,830	94.1	1,120	177,392	158.4
West South Central						
Arkansas	314	26,712	85.1	315	42,395	134.6
Louisiana	220	28,955	131.6	215	51,282	238.5
Oklahoma	378	44,426	117.5	366	67,929	185.6
Texas	1,007	117,456	116.6	980	192,725	196.7
Total	1,919	217,549	113.4	1,876	354,331	188.9
Mountain						
Montana	244	18,675	76.5	348	29,937	86.0
Idaho	172	15,532	90.3	174	22,725	130.6
Wyoming	104	7,834	75.3	104	12,795	123.0
Colorado	363	41,977	115.6	364	54,906	150.8
New Mexico	121	9,128	75.4	119	14,530	122.1
Arizona	143	10,828	75.7	137	15,960	116.5
Utah	155	17,765	114.6	154	26,218	170.2
Nevada	39	3,666	94.0	37	5,215	141.0
Total	1,341	125,405	93.5	1,437	182,286	126.9
Pacific						
Washington	553	38,220	69.1	542	52,415	96.7
Oregon	310	26,174	84.4	296	35,752	120.8
California	1,299	134,256	103.4	1,283	183,511	143.0
Total	2,162	198,650	91.9	2,121	271,678	128.1
Unallocated	237	22,813	96.3	229	33,555	146.5
Grand Total	25,245	2,383,907	94.4	24,928	3,577,892	143.5

NUMBER OF MAKES OF TIRES HANDLED

	April 1, 1927		*April 1, 1928*		*April 1, 1929*	
	No. of Dealers	*Per Cent of Total*	*No. of Dealers*	*Per Cent of Total*	*No. of Dealers*	*Per Cent of Total*
No. of Makes:						
One	17,594	47.9	16,663	54.2	13,902	58.5
Two	13,790	37.5	10,153	33.0	7,294	30.7
Three	3,779	10.3	2,757	9.0	1,743	7.3
Four	1,078	2.9	833	2.7	571	2.4
Five	361	1.0	234	0.8	191	0.8
Six	148	0.4	93	0.3	76	0.3
Total	36,750	100.0	30,733	100.0	23,777	100.0

ks of Dealers to New Peak

Held 94.4 Casings and 143.5 Tubes ng to Survey of Rubber Division

Whereas last year 83.82 per cent of all dealers had less than 101 casings in stock, this year only 79.72 per cent fell into that class.

An outstanding feature of the survey was the continued gains made by balloon tires in dealers' stocks. The current survey reports the average dealer as carrying 69.1 balloon tires as against 45.7 in 1928, 35.5 in 1927, 21.9 in 1926, and only 14.8 in 1925. There is, of course, a corresponding decrease in the number of high pressure casings carried. Despite the rise of truck pneumatics, there has been a gain in the stocks of solid and cushion tires in dealers' hands from 27 last year to 35 in 1929. This is a reversal of the trend shown in the October survey last year, when solid tire stocks dropped from 26.1 to 23.4, but may be accounted for by the fact that a much smaller number of dealers reported on this item in October, 1928, as compared with October, 1927.

Florida Has Highest Average Stock

Florida as usual has the highest average of stocks in the country, tire dealers in that state holding an average of 146.5 casings on hand as compared with 143.6 for New Jersey retailers. Close behind is the District of Columbia where the average dealer carried 142.7 casings, and next in line are Louisiana with an average of 131.6 and Tennessee with 121.3. Dealers in 11 other states carried an average stock of more than 100 tires, and among the territorial groups the West South Central states of Arkansas, Louisiana, Alabama and Texas had the highest average. Vermont dealers with 53.3 casings and Virginia dealers with 54.2 had the lowest average figures for the country.

In number of inner tubes in stock, Louisiana dealers led with an average of 238.5. District of Columbia dealers, averaging 219.2 tubes, were in second place, followed by those of Florida with an average of 190.9. Montana was lowest in number of tubes held by its dealers, their average stock being only 86.

How consistently the tendency toward concentration of sales efforts by dealers is progressing was proven by the fact that 58.5 per cent of all dealers reported that they handled only one make of tire as compared with 54.2 per cent in 1928 and 47.9 in 1927. Of the dealers with more than a single line, 30.7 per cent handle two makes, 7.3 per cent handle three makes, and only 3.5 per cent handle four or more makes.

Other information obtained from the dealers through these questionnaires indicate that more every year are selling automobiles, selling batteries, selling tire repair materials, repairing inner tubes, and installing equipment for vulcanizing. At the present time, according to the present survey, fully 39 per cent of all tire dealers sell automobiles, while 61.1 per cent handle batteries. These figures would

(*Continued on page* 142)

DEALERS' STOCKS OF AUTOMOBILE TIRES

	April 1, 1928			*April* 1, 1929		
Total casings (including balloons)	*Number* 2,514,112	*Dealers Reporting* 30,974	*Average Per Dealer* 81.2	*Number* 2,383,907	*Dealers Reporting* 25,245	*Average Per Dealer* 94.4
Balloon casings	1,008,223	22,039	45.7	1,400,528	20,279	69.1
Inner tubes	3,816,169	30,933	123.4	3,577,892	24,928	143.5
Solid and cushion	37,873	1,403	27.0	40,151	1,146	35.0

AVERAGE STOCKS PER DEALER

	1925	1926	1927	1928	1929
Total casings (including balloons)	62.2	63.9	70.6	81.2	94.4
Balloon casings (alone)	14.8	21.9	35.5	45.7	69.1
Inner tubes	102.1	119.6	120.9	123.4	143.5
Solid and cushion tires	20.1	26.9	24.7	27.0	35.0

DEALERS CLASSIFIED BY VOLUME OF STOCK

	April 1, 1928			*April* 1, 1929		
Casings:	*Number of Dealers*	*Per Cent of Total Dealers*	*Number of Casings*	*Number of Dealers*	*Per Cent of Total Dealers*	*Number of Casings*
Less than 10	5,356	17.29	30,651	3,732	14.78	18,539
10 to 25	7,207	23.27	132,836	6,146	24.35	104,455
26 to 50	7,272	23.48	280,394	5,479	21.70	204,164
51 to 100	6,127	19.78	392,806	4,768	18.89	339,146
101 to 200	3,011	9.72	483,689	2,903	11.50	408,354
201 to 300	873	2.82	205,746	861	3.41	212,459
301 to 400	392	1.26	131,136	436	1.73	152,155
401 to 1,000	511	1.65	325,131	650	2.57	391,641
Above 1,000	225	.73	531,723	270	1.07	552,994
Total	30,974	100.00	2,514,112	25,245	100.00	2,383,907

SUMMARY OF DEALERS' BUSINESS

	April 1, 1928		*April* 1, 1929	
	Number	*Per Cent of Total*	*Number*	*Per Cent of Total*
Total reports received	33,148	100.0	25,869	100.0
Sell automobiles	12,532	37.8	10,098	39.0
Sell gasoline	22,100	66.9	19,357	74.8
Sell batteries	17,122	51.7	15,796	61.1
Sell tire repair materials	19,966	60.2	17,820	68.9
Repair inner tubes	19,269	58.1	17,210	66.5
Equipment for vulcanizing tires	4,275	12.9	3,750	14.5
Sell tires on installment	6,080	18.3	5,636	21.8

DEALERS' STOCKS OF SOLID AND CUSHION TIRES

States	*No. of Dealers*	*No. on Hand*	*States*	*No. of Dealers*	*No. on Hand*
Alabama	18	597	Nevada	3	23
Arizona	10	86	New Hampshire	6	178
Arkansas	9	72	New Jersey	38	1,563
California	90	3,698	New Mexico	7	53
Colorado	25	438	New York	84	3,952
Connecticut	15	296	North Carolina	35	641
Delaware	3	18	North Dakota	5	86
Dist. of Col.	5	284	Ohio	77	2,270
Florida	15	364	Oklahoma	11	471
Georgia	16	345	Oregon	15	77
Idaho	11	144	Pennsylvania	93	4,136
Illinois	44	2,937	Rhode Island	4	114
Indiana	43	3,181	South Carolina	2	12
Iowa	27	860	South Dakota	5	86
Kansas	22	461	Tennessee	18	270
Kentucky	12	199	Texas	22	578
Louisiana	17	281	Utah	7	96
Maine	12	200	Vermont	6	58
Maryland	23	956	Virginia	28	439
Massachusetts	31	845	Washington	30	679
Michigan	28	1,037	West Virginia	18	246
Minnesota	20	534	Wisconsin	33	853
Mississippi	17	391	Wyoming	4	62
Missouri	42	3,698	Unallocated	16	728
Montana	7	271			
Nebraska	17	287	Total	1,146	40,151

Schaphorst's CHATS *with the* ENGINEER

By W. F. SCHAPHORST, M.E.

Pipe Bending Kinks

A QUESTION that is often asked is: "What is the best way to bend pipe?" By way of reply, the following experiences will probably be of interest:

To bend large pipes, fill with dry sand and plug the ends. Heat to a red heat in the localities to be bent and then bend. Be sure that the sand is dry. Where bends are slight, it is often unnecessary to use sand or resin. The object of sand or resin is simply to keep the sides of the pipe from collapsing, or to prevent reduction of flow area. If wet sand is used, and if the ends are plugged, the pipe may burst when heated, due to the steam pressure generated.

Instead of sand, resin is good. There is, however, a "right way" and possibly several wrong ways to use resin. An example of a wrong way was recently brought to my attention where the mechanic filled the pipe with resin, plugged the ends, and heated the pipe at the place where he wanted to bend it. He watched for a "red heat" just as he would had he filled the pipe with sand. The result was—a violent explosion.

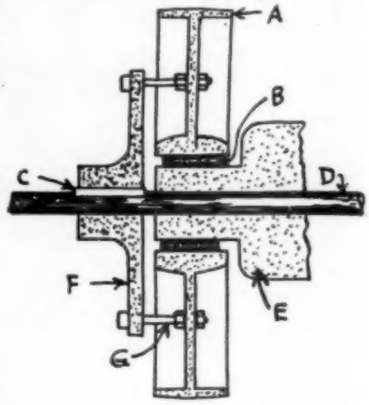
To use resin correctly, pour it into the pipe and allow it to cool and harden. As soon as the resin is hard, bend the pipe cold. Don't heat it. Then after the pipe is bent, heat the pipe all over sufficiently to melt and remove the resin.

Equal results may be secured by using lead instead of resin. I have been told that on cold days in the far North they sometimes fill the pipe with water and let it freeze, and then bend the pipe. It sounds plausible, but care must be exercised there on account of the expansion of water when it freezes.

Many excellent mechanical devices are on the market for bending pipe. To bend large, stiff pipe slightly, and inexpensively, there is nothing handier or more efficient, in my judgment, than a hydraulic pipe bender driven by a hand pump.

To Eliminate Shaft Deflection

ONE way in which every bit of belt pull can be eliminated from shaft bearings is shown in the sketch herewith. Shaft deflection due to belt pull is therefore eliminated also. This method requires less space, and instead of two additional bearings as are sometimes used, there is only one—a roller bearing which consumes less power than ordinary plain bearings.



The sketch shows how, by turning down the housing "E" of the motor if possible, or by casting such a housing and attaching to the motor and then mounting the pulley on this housing and equipping with roller bearings "B" between the pulley and hub, all the belt pull falls directly upon the shaft housing. The flexible coupling "F" shown at the left is keyed onto the shaft "D" and is connected to the pulley "A" by means of bolts "G", or by other methods familiar to all who use flexible couplings.

By applying this method there can be no binding or deflection in the shaft, and friction is reduced to the minimum. No more space is used here than when the pulley is placed, as it often is, on the end of the shaft, thereby giving the undesired overhang. With this method the force on the shaft is purely a twisting or torsional action—an ideal condition. The only bending is that caused by the weight of the shaft itself plus whatever the shaft supports.

Operations on Commodity Exchanges

AN interesting table of comparative methods of trading in various products on the New York commodity exchanges has been published as a bulletin by Pynchon & Company, New York City. The size of the unit contract transaction, the unit quotation together with the margins acceptable and the brokerage commissions allowed are listed. The amount of fluctuation per point is also shown. A part of the table is given below:

Commodity	Contract	Quoted	Fluctuations	Commission for Round Turn	Margin
COTTON	100 Bales (500 lbs.) 50,000 lbs.	1/100th of a cent per lb.	$5.00 per point	$25. when price is $25.00 or under $30. when price is $25.01 to $30. $35. when price is $30.01 to $35. $40. when price is $35.01 to $40 $45. when price is $40.01 to $45. And an additional $5.00 for each advance of 5c	$500 per contract
COFFEE	250 Bags (32,500 lbs.)	1/100th of a cent per lb.	$3.25 per point	$25. when price is $9.99 or under $30. when price is $10.00 to $19.99 $40. when price is 20.00 and over	$250 " "
RAW SUGAR	50 Tons (2,240 lbs.) 112,000 lbs.	1/100th of a cent per lb.	$11.20 per point	$25. when price is $3.99 or under $30. when price is $4.00 to $9.99 $35. when price is $10.00 to $12.99 $40. when price is $13.00 to $17.99 $50. when price is $18.00 and over	$250 " "
CRUDE RUBBER	5,600 lbs. (2½ tons)	Tenths of a cent per lb.	$5.60 per point	$15.00	$250 " "
RAW SILK	5 Bales (650 lbs.)	Cents per lb.	$6.50 per point	$12.50 when price is $6. or under $15.00 when price is $6. to $7.00 $18.00 when price is $7. or over	$250 " "
TIN	5 Tons (12,200 lbs.)	5/100ths of a cent per lb.	$6.50 per point	$12.50 when price is $.50 or under $15.00 when price is $.50—.60 $18.00 when price is $.60 or over	$250 " "

Rubber Chemists Meet in Columbus

Over 250 Attend Interesting Meeting Held at Ohio State University—Fall Meeting to Be Held in the East

Neil House, Columbus, Ohio, Headquarters of the A. C. S. and Where the Rubber Division Dinner Was Held

THE Rubber Division meeting, held on May 1, in conjunction with the 79th meeting of the American Chemical Society at Columbus, Ohio, was attended by over 250 rubber chemists. The headquarters of the division were at Neil House but the papers were read in Room 120 of the Chemical Engineering building of the Ohio State University. The papers, abstracts of which appear on the following page, proved of great interest as evidenced by the large number of questions asked the speakers by members in attendance.

In the absence of Arnold H. Smith, Chairman of the Division, who is still in Europe on business, Stanley Krall, assistant chairman, conducted the meeting. Due to the small number of papers scheduled only one day was given to the meeting. It started at 9.30 A. M. and five papers were completed before the luncheon recess. In the afternoon session the other two papers were read, followed by a short report of progress by Dr. Gibbons on the activities of the Physical Testing Committee.

Future Group Meeting Scheduled

A short business meeting followed. Among the announcement made at this meeting were those of the date of the next meeting of the Akron Group at Goodyear Hall on May 20. The symposium plan will be used by this group and will take up various engineering problems in rubber manufacturing. The May 20 meeting will be on "Steam Power Engineering" and will consist of papers on power requirements, generation of power and utilization of power in mechanical work and in vulcanization. The New York Group, through its Chairman, W. B. Wiegand, announced that its next meeting was scheduled for June 19.

Discussion on Mr. C. R. Boggs' suggestion that the great distance of Minneapolis, the location of the Fall, 1929, meeting of the A. C. S., from the various rubber centers would hold down the attendance of rubber chemists very materially, brought out the point that to attend this meeting would mean a full week's absence on the part of chemists located in the East and almost as long for those in the Akron and Pittsburgh districts. A committee took up this matter with C. L. Parsons, Secretary, A. C. S., and an agreement was reached to permit the Rubber Division to select its own meeting place, independent of the A. C. S. At present it is planned to hold this meeting in New York or vicinity, in September, 1929, but no definite plans can be announced at this writing.

The secretary of the Division, H. E. Simmons, made a secretary's and treasurer's report, both of which were adopted as read. Approximately $1,700 is in the treasury at present. Dr. Simmons urged members to inform him promptly of any change in addresses so that no copies of the "Rubber Chemistry and Technology," the division's quarterly, would be lost in the mails. Members having extra copies of either Vol. 1 No. 1 or Vol. 2 No. 1 were urged to send them in to the Secretary as these issues are out of print. Prompt payment of dues was also urged.

Dr. Simmons suggested to the chairmen of all rubber groups that they endeavor as far as possible to limit the type of papers presented at group meetings to those of a general or engineering character, rather than of a chemical or other technical nature so that there would be no lack of suitable technical papers for the semi-annual meetings of the Division.

The thanks of the Division were extended to the Columbus committee on entertainment and reception. This committee consisted of A. C. Eide (American Zinc Oxide Company), Chairman; R. M. Reel (Pharis Tire & Rubber Company); and M. K. Easley (American Zinc Oxide Company). Thanks were also given to Prof. Wm. McPherson and his committee and student aides for their help in connection with the meeting. Greetings of the Division were sent to Chairman A. H. Smith, who is not expected to return from Europe until late in June.

Dinner Held at Neil House

In the evening, the banquet of the Division was held in the Ball Room of the Neil House. Approximately 200 members and guests attended the dinner which was made more enjoyable by excellent dancing and singing vaudeville and cabaret acts arranged by the entertainment committee. The menu was excellent as was the entertainment.

The toastmaster for the evening was R. P. Dinsmore. He introduced the various speakers and was in his usual good form. Charles L. Parsons, secretary of the A. C. S., spoke briefly on the history, development and importance of the Rubber Division. H. E. Howe, editor of *Industrial and Engineering Chemistry*, suggested in his talk that the Division, through several leading members, prepare a monograph on rubber covering all phrases of the subject, what it is, how used, manufacturing processes, etc. The other speakers were Cecil E. Boord, professor of Organic Chemistry of Ohio State University and C. M. Newcomb who

made a humorous address on "Why Do We Laugh."

A number of trips to industrial plants and public works in the vicinity of Columbus and Dayton were planned, some of which were taken by rubber chemists. The only rubber company on this list was the Henderson Tire & Rubber Company plant in Columbus.

Abstracts of Papers

The Effect of the Presence of Magnesium Oxide or Zinc Oxide on the Products of the Destructive Distillation of Natural Rubber. THOMAS MIDGLEY, JR., and ALBERT L. HENNE. *Baker Laboratory, Cornell University.*

Natural rubber has been mixed with ZnO or MgO, and destructively distilled. In each case the distillates have been fractioned; ethylenic, dienic, hydro-aromatic, and aromatic compounds have been obtained. These results have been compared with those obtained by distillation of natural rubber alone and in the presence of metallic Zn or Mg. A mechanism of decomposition is tentatively suggested which would account for the observed facts.

The Influence of Pigments on Some of the Physical Properties of Unvulcanized Rubber. HARLAN A. DEPEW. *New Jersey Zinc Company.*

Information is presented regarding the influence that pigments have on some physical properties of unvulcanized rubber. Reasons are given for believing that the relative insolubility of unvulcanized rubber containing fine pigments is due to flocculated pigment forming a semi-permeable membrane that prevents the rubber aggregates from diffusing out into the solvent. Evidence is given regarding existence of a structure that develops in milled rubber on storage.

The Transformation of Energy by Rubber. IRA WILLIAMS. *Grasselli Chemical Company.*

Mechanical energy expended on a strip of rubber causes plastic flow and elastic strain. The energy expended to produce elastic strain is converted reversibly into heat. All physical measurements conducted on a piece of rubber record a combination of plastic flow and elastic strain. Elimination of the time factor eliminates plastic flow. If stress-strain curves are obtained in the course of a few seconds the rubber will be found to support an increasing load with increasing temperature. Vulcanized rubber shows much plastic flow at high temperature. Unvulcanized rubber shows the Joule effect and differs from vulcanized rubber only in degree. Vulcanization appears to consist in the suppression of plastic properties rather than in the creation of elastic material.

The Testing of Automotive Rubber Parts Assembled Under Compression. FRANZ D. ABBOTT *Firestone Tire and Rubber Company.*

Present-day test specifications on automotive rubber parts are not only incomplete and misleading but are entirely lacking in uniformity. This is particularly true of compression and permanent set tests on automotive mechanical rubber parts assembled under compression, and an effort has been made to show the urgent need for unification of such methods.

Data are presented to show that high tensile is no criterion of relative resistance to permanent set and that hardness is not a measure of deflectability. Likewise deflection and permanent set under compression are greatly influenced by the size and shape of test piece, method of cutting the sample, the gage and methods of measuring it, and condition and kinds of surface in contact with the test piece. Compression and permanent set testing equipment are discussed, and descriptions and cuts are offered of some newly designed laboratory equipment. One of these, the Compressetometer, has been found extremely useful in making deflection, hysteresis, and permanent set tests (the latter under constant load or constant distortion as desired).

The Evaluation of Reclaim Rubber in Tread Stock. C. W. SANDERSON, *Goodyear Tire and Rubber Company.*

A series of tread compounds were made up by proportion between a non-reclaim stock and an all reclaim stock. These compounds were road-tested and the results shown in relative values. Physical properties of the series, such as tensiles, abrasion and tear are also shown as relative values and are compared to the road wear. It is shown that reclaim rubber has a value, judged by abrasion of 25 to 40 per cent of new rubber. Tensile and lamination tear are shown to be reasonably good criteria of road wear.

Some Observations on Carbon Black. C. M. CARSON, *Goodyear Tire and Rubber Company.*

A number of experiments on the relation of physical and chemical properties of carbon black to their action in rubber mixes have been made. These experiments show that, (1) adsorption of black is related to rate of care, highly adsorptive blacks giving slow curing rubber stocks with certain exceptions, and low adsorptive blacks giving fast curing stocks; (2) the effect of heat on black is to give a dry, cindery carbon which is highly adsorptive but gives a faster curing stock; (3) a reaction product of sulphur, zinc oxide and a material absorbed on carbon black, has been isolated and found to have some accelerating action on vulcanization; (4) different blacks when dispersed in a rubber cement, then centrifuged, are still found to vary as the modulus of the black varies in a Captax accelerated, highly black-test stock.

A New Flexing Machine for Rubber. PHILIP M. TORRANCE and LESTER C. PETERSON. *The India Tire and Rubber Company.*

A description with photographs of a device for rapid flexing of a number of pieces of rubber. The machine is for laboratory use and consists of a rotor disc keyed to the shaft of a ¼ h.p. synchronous motor and radially slotted about its periphrey to take 12 samples. Around this a steel ring is placed off center in relation to the rotor. The test samples used were 1 in. wide, 1⅛ in. long and 3-10 in. thick, having two semi-circular grooves molded across their width. The motor operates at 1725 r.p.m. and in order to reduce friction the samples were lubricated with glycerine. The result obtained with this machine check qualitatively with the road test which were run. It was found that certain anti-oxidants are valueless. Modulus and methods of processing apparently exert an an influence on this phenomenom. A thermometer inserted in a mercury well in the top of the flexing ring showed considerable variations in operating temperatures.

ADVANCE LOCATION AND DATES
of
A. C. S. MEETINGS

Fall, 1929* .....Minneapolis, Minn.
Spring, 1930 .....Atlanta, Ga.
Fall, 1930 .....Cincinnati, Ohio
Spring, 1931 .....Indianapolis, Ind.

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* The Rubber Division has received permission from C. L. Parsons, Secretary, A. C. S., to hold their 1929 Fall meeting in a more central location. A committee of the Division will draw up plans for a meeting probably in the New York district. Full details are not ready as yet.

Czechoslovakia—

Expands Its Rubber Trade

Production Has Steadily Increased Since the Creation of This New State Following the War

By HARRY W. NEWMAN

Rubber Division, Department of Commerce

Prague, the Capital of Czechoslovakia, and a Rubber Manufacturing Center

THE Czechoslovak rubber industry, although expanding in recent years, is not as yet able to fulfill all local requirements.

Although official figures on production are not available, the imports of crude rubber reflect to a fair degree the extent of domestic output. Imports of crude rubber totaled 1,370 tons in 1924, 1,558 tons in 1925, 1,870 tons in 1926, 2,672 tons in 1927 and 3,138 tons in 1928.

With the dismemberment of the Austro-Hungarian Empire about 80 per cent of the industries of the former dual monarchy was contained in the present state of Czechoslovakia. In most industries Czechoslovakia is oversupplied with factories and its principal complaint has been an undersupply of markets. In the rubber industry the opposite, however, is the case. Prior to the World War it was centered in Austria proper and the present area of Czechoslovakia contained only rubber factories of minor importance.

The new state, protected by a high tariff, has encouraged a local rubber industry whose progress has been rapid. Although it is a relatively young enterprise, seven important rubber factories are now producing all classes of rubber goods.

The Prague Rubber Goods Factory is an offspring of the Semperit Austro-American Rubber Works, Ltd., of Vienna. Although it is not detached entirely from the Austrian works for nationalized reasons, it is associated closely in stock ownership.

Optimit Rubber & Textile Works, of Odrau, was established in 1863 but was reorganized in 1922 with a capital of 11,000,000 crowns (the crown equals $0.0296 at present rate of exchange). The chief occupation of its 600 employees is the manufacture of rubber textiles.

The Matador Rubber & Balata Works, of Bratislava, manufactures a complete line of rubber and balata belting, automobile tires, and rubber-proofed goods. It furnishes employment to about 500 workmen. Továrna na kabele, úc. spol. in Bratislava, employs 1,000 workmen and produces principally insulated cables and other technical rubber goods. J. Reithoffer's Sons, of Trencin, a subsidiary of the larger Austrian concern, manufactures principally rubber insulated cables and other technical rubber goods. Jos. Kudnac & Co., of Nachod, employs about 145 workmen; Victoria Rubber Goods Factory, of Brno, 250; and the Vereinigte Berlin-Frankfurter Gummiwarenfabrik, of Hradek, about 300.

While the local industry has made considerable strides in the last few years, the country's unfavorable balance of trade in rubber products is still high and in fact increased in 1928 to $6,137,000 as compared with $3,378,000 in 1926. The primary reason for the continued increased unfavorable balance is the inability of the local industry to fulfill the growing tire requirements of the country. While the Matador Works produce some tires, the total output is still far too inadequate in comparison to the demand and imports in casings during 1928 equalled 66 per cent of the total rubber goods imported.

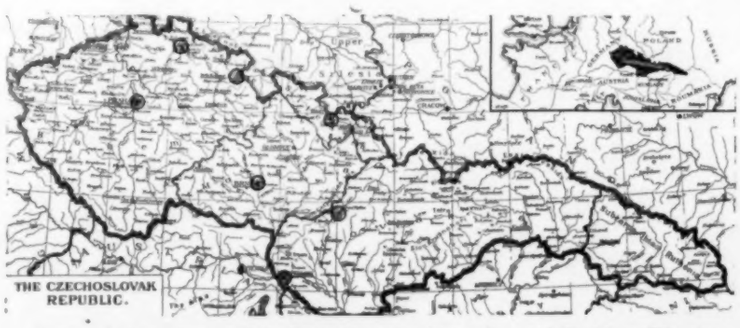
Czechoslovak Trade in Rubber Goods, by Classes

(Kilos)

Class	*Imports* 1927	*Imports* 1928	*Exports* 1927	*Exports* 1928
Automotive rubber goods	3,122,500	3,845,000	9,500	15,000
Rubber footwear	573,100	926,000	41,100	48,000
Mechanical rubber goods	179,900	202,000	181,700	185,000
Miscellaneous rubber goods	784,300	891,300	600,900	728,500
Total	4,659,800	5,864,300	833,200	976,500

Imports of automotive rubber goods in 1927 increased in volume 57 per cent and in value 45 per cent, as compared with 1926. In 1928 the increase in volume in this class was 32 per cent. The export trade for 1928 as compared with 1927, manifested an increase of 12 per cent.

In 1927 exports of mechanical rubber goods exceeded imports by a narrow margin, but in 1928 imports advanced to such an extent that a difference of 17,000 kilos in favor of exports was declared. In general, the greater



Map of Czechoslovakia Showing the Location of Rubber Plants

portion of the exports of rubber goods is in miscellaneous articles, such as rubber toys, thread, elastic, and similar goods. Imports of the miscellaneous class are noteworthy, but are not increasing at the rate of exports.

Czechoslovakia is one of the few countries in which imports of solid tires have manifested an increase in recent years—from 654,000 kilos in 1926 to 756,000 kilos in 1927. Figures for 1928 are not available. Germany in the latter year supplied 267,000 kilos, followed by Great Britain with 183,000 kilos, and France with 87,000 kilos.

During 1927 an agency was established in Prague by the Russian concern Resionotruct for all rubber products, including automobile tires. Russian tires were sold in this section of the former Austro-Hungarian Empire before the World War and maintained a good reputation.

Rubber footwear is manutactured locally, but as yet the production is unable to satisfy the domestic demand. The principal source of supply is Austria, followed by France as a poor second. So far, the United States' participation in the trade has been insignificant.

Annual exports of rubber footwear which do not exceed 50,000 pairs are of minor importance. Most of them go to Austria.

The most noticeable recent progress of the rubber industry has been made in mechanical rubber goods, notably belting and hose. The principal outlets for Czechoslovak belting are Germany, Austria, Great Britain, and Denmark.

Imports of miscellaneous rubber goods in 1928 increased in volume as compared with 1927, while exports also increased slightly. Rubberized textiles appear to be an important branch of the domestic rubber industry with exports far exceeding other classes.

Marking Rubber Goods for Export

ACCORDING to the recent report of the British Standing Committee respecting the marking of rubber manufactures, the following are the recommendations in full of the committee. The committee does not consider that a case has been made out for the marking of the rubber goods concerned, at the time of importation into Great Britain. It does, however, recommend that an order be made for the marking of various manufactures when exposed for sale in the United Kingdom.

Recommendations

1. The descriptions of imported rubber manufactures given below shall bear an indication of origin at the time of sale or exposure for sale in the United Kingdom.

2. The indication of origin shall be embossed, impressed, stamped, printed, or stenciled.

3. The position of the indication of origin shall be as shown below:

	Position of the Mark
Rubber in sheets, insertion and jointing (other than mats, matting and flooring)	On the sheet, insertion or jointing at intervals of two yards.
Hose and tubing of rubber, or rubber and other materials, armored or not	On a label securely attached to each coil.
Tennis and golf balls, play balls, (unburstable or not), uncovered beach balls, football bladders	On each ball or bladder, and also on the container (if any).
Mats	On the mat, or on a label securely attached or affixed thereto.
Matting and flooring	On a label securely affixed or attached to the exposed surface of the roll of matting or flooring.
Tiles	On a box or other container.
Gloves	On one of each pair of gloves.
Rubber proofed piece goods, including hospital sheeting	On a label securely attached or affixed to the exposed surface of each roll.
Goods of the following descriptions, consisting wholly or mainly of rubber:— Valves (not including washers, bottle rings, cord rings, fruit jar rings and Phoenix rings)	(a) On each valve; or (b) on the box or other container; or (c) on a label securely attached to the goods.
Hot water bottles, pillows, beds or cushions; air beds and cushions; anklets; leggings; aprons for surgical and dental work; breast relievers and shields; crutch shoes; chin straps and throat straps; douches; dental gas bags; douching sheets; finger stalls; enemas; face masks; ice bags; obesity garments; pessaries; syringes; sponge bags; urinals; whirling sprays.	(a) On the article itself; or (b) on a label securely affixed or attached to each article; or (c) in cases in which the article is habitually sold or exposed for sale in a case or other container or fixed on a card, on the case, container or card.
Horn bulbs and pedal rubbers	(a) On the article itself; or (b) on a label securely affixed or attached to the article; or (c) where the goods are sold or exposed for sale in a container, on the container.
Sports grips	On each grip.
Stair nosing	On the article itself at intervals of nine feet.
Aprons, babies' knickers and bibs, made of calendered rubber sheeting, and bathing caps	(a) On the article itself; or (b) on a label securely attached or affixed thereto; or (c) if it is sold in a container, on the container.
Tobacco pouches	On each tobacco pouch.
Erasers	On each eraser.
Soles and heels	On each sole or heel, and also on the box or other container, or where the goods are attached or affixed to a card, on the card.
The following golf accessories: Tees, ball cleaners.	On each tee or ball cleaner.
Ebonite sheets of more than three-sixteenths of an inch in thickness and four square feet in area.	In one corner.
Uncovered elastic cords and elastic stationery bands	On the box or other container.
Corks, except corks fitted in bottles	On the box or other container.
Sponges	On the box or other container, or on a label securely attached or affixed to each sponge.

4. Nothing in these recommendations shall require a piece of hose or tubing, matting or flooring, or rubber proofed piece goods or hospital sheeting sold from a coil or roll to bear an indication of origin, provided that the coil or roll from which it is sold bears an indication of origin in accordance with these recommendations.

(NOTE: The usual procedure under the Merchandise Marks Act of the United Kingdom is for the Board of Trade to issue a draft order containing the recommendations of the committee. This draft order is tabled in both Houses of Parliament for 20 days and if no resolutions opposing it are passed a final order is issued bringing the recommendations into effect. The effective date is usually three months from the date of issuance of the final order.)

Tire Dealers Stocks Survey

(*Continued from page* 137)

indicate that the better grade of tire dealer is more and more being considered as a valuable outlet by manufacturers in other lines.

That the "pay-as-you-ride" plan is increasing its popularity slowly but steadily among dealers is indicated by the fact that 21.8 per cent of the dealers report that they are selling tires on instalments as against 18.3 per cent on April 1 of last year. A geographic division of the survey, however, shows that instalment selling is most popular in the West South Central states and is gaining least headway in the Rocky Mountain states. The greatest falling off was shown in these Rocky Mountain states, only 17.67 per cent of the dealers there reporting instalment sales as against 23.27 per cent last October. The three Pacific coast states, which were lowest in percentage of dealers reporting instalment sales in October, 1928, increased their percentage in 1929 from 19.23 to 23.13 accounting for the widest rate of gain in this respect.

In the survey of October 1, 1928, reports of stocks on hand were received from three large mail order houses and chain store houses. In the present survey, the number of such reports thus far is not sufficient to make possible publication of statistics without disclosing the position of reporting companies. Reports received, however, indicate an increase in such stocks over the figure of 615,308 casings and 730,889 inner tubes reported for last October.

RUBBER CHEMISTRY and Technology

The Oxidation of Vulcanized Rubber

By A. VAN ROSSEM AND P. DEKKER

(*Concluded from* THE RUBBER AGE, *April* 25, 1929)

IN the preceding portion of this work the products which were obtained as a film when the alcoholic potash extract was heated with more alcoholic potash were tacitly designated as oxidation products. Of course it was desirable to prove by analysis that these were really oxidation products, and to learn whether their composition gradually changed with increasing time of cure and during aging.

In the following work vulcanized rubber was used in all cases prepared from F. L. sheets previously extracted with acetone. In these vulcanizates the percentage of oxidation products increased during vulcanization as well as on aging much faster than in the case of unextracted rubber, large quantities of oxidation products being required for analysis.

A compound consisting of 92.5 parts F. L. sheets previously extracted with acetone and 7.5 parts sulfur was press cured for 2, 3, 4, and 6 hours at 147° C. The combined sulfur, alcoholic potash extract, and oxidation products were then determined. A rather large quantity of oxidation products were obtained by working with 100 g. of rubber. Care was taken to extract these oxidation products with water until an alkaline reaction was no longer obtained: they were then dried in a current of carbon dioxide.

These oxidation products have the appearance of thin, brownish, opaque, rubber-like films, which however, show little extensibility or elasticity. It is notable that these products are insoluble in the ordinary rubber solvents, such as benzene, xylene, benzine (b.p. 40° to 60° C.), and ether, and only swell slightly in them.

The following determinations were made:

1. Ash,
2. Nitrogen (Kjehldahl),
3. Sulfur, by the usual method of Kratz, Flower, and Coolidge,
4. Carbon and hydrogen, by Heslinga's method[9].

At first an attempt was made to determine the oxygen content directly by Ter Meulen's method. This method is very good in the case of organic substances containing no sulfur, but as the oxidation products contain sulfur, difficulties were encountered which could not easily be avoided. Therefore the direct determination of oxygen was finally disregarded, and the oxygen determined by difference. It may be mentioned that the determination of carbon and hydrogen by Heslinga's method may be done rapidly, requiring about an hour for completion.

Table VII

ANALYSIS OF THE VULCANIZED RUBBER AND THE OXIDATION PRODUCTS

Compound: Extracted F. L. sheets ..... 92.5 parts
Sulfur ..... 7.5 parts

Analysis of the rubber after extraction with acetone.

Time of cure	2 hrs.	3 hrs.	4 hrs.	6 hrs.
Ash	0.5%	0.4%	0.4%	0.5%
Nitrogen	0.4%	0.4%	0.4%	0.4%
Combined sulfur	3.7%	5.3%	6.2%	7.3%
Carbon	82.9%	81.7%	80.8%	79.9%
Hydrogen	11.7%	11.7%	11.6%	11.3%
	99.2%	99.5%	99.4%	99.4%
Hydrogen/carbon	8.5	8.6	8.6	8.5
Alcoholic potash extract	0.9%	1.6%	1.6%	2.5%
Oxidation products	0.4%	0.7%	1.0%	1.4%
Analysis of oxidation products.				
Ash	1.8%	1.4%	3.6%	1.6%
Nitrogen	0.1%	0.1%	0.1%	0.1%
Combined sulfur	3.2%	4.1%	5.5%	6.6%
Carbon	80.0%	78.2%	76.0%	77.1%
Hydrogen	11.2%	11.0%	10.8%	11.0%
	96.3%	94.8%	96.0%	96.4%
Oxygen	3.7%	5.2%	4.0%	3.6%

These results permit the following conclusions to be drawn regarding the products isolated from the alcoholic potash extract:

1. The ash content is doubtless due to the treatment with alcoholic potash.
2. The products contain combined sulfur.
3. The products contain 3.7 to 5.2% oxygen, and therefore may truly be designated as oxidation products. No importance need be attached to the varying amount of oxygen, since it was determined by difference.

The question is asked, what is the source of this quantity of oxygen during vulcanization. After a six hour cure 1.4% of these oxidation products are formed, containing about 4% of oxygen, so that calculated on the vulcanized rubber we have $0.04 \times 1.4 = 0.056\%$, that is 56 mg. oxygen per 100 g. rubber. Venable and Fuwa[10] have shown that 100 cc. of rubber at atmospheric pressure dissolves 7.3 cc. of oxygen, and Fry and Porritt[11] have recently shown that raw rubber in all probability takes up small amounts of oxygen during milling.

A compound was now mixed, consisting of 92.5 parts F. L. sheets previously extracted with cold acetone, and 7.5 parts sulfur, cured in sheets 1 mm. thick for four hours at 147° C., aged in diffuse light, and the content of oxidation products determined after 1, 2, 4, and 8 weeks. It was shown that even after two weeks a portion of the alcoholic potash extract is no longer soluble in ether. This portion likewise was isolated, extracted with water, and dried in carbon dioxide. Again analyses were made of the oxidation products, both the ether-soluble and insoluble. In the extracted rubber the ash, combined sulfur, oxygen (by difference), nitrogen, carbon, and hydrogen were determined. The results of these analyses are given in Table VIII.

Table VIII

ANALYSES OF OXIDATION PRODUCTS DURING PROGRESSIVE OXIDATION AND STORAGE IN DIFFUSE LIGHT

Compound: F. L. sheets (extracted) ..... 92.5 parts
Sulfur ..... 7.5 "
Vulcanized in sheets 1 mm. thick four hours at 147° C.

	At first	After 1 wk.	After 2 wks.	After 1 mo.	After 2 mos.
Organic acetone extract	0.8%	2.2%	3.2%	4.2%	5.0%
Combined sulfur	6.6%	6.6%	6.5%	6.7%	6.9%
Alcoholic potash extract	1.6%	6.6%	6.1%	6.9%	6.5%
Oxidation products, ether soluble	1.0%	5.8%	4.9%	5.9%	5.0%
Oxidation products, ether insoluble	0.0%	0.0%	4.6%	8.1%	9.5%

Analysis of the rubber after extraction with acetone.

	At first	After 1 wk.	After 2 wks.	After 4 mos.	After 8 mos.
Ash	0.5%	0.5%	0.5%	0.8%	0.7%
C. S.	6.6%	6.6%	6.5%	6.7%	6.9%
N.	0.4%	0.4%	0.4%	0.4%	0.4%
C.	80.5%	79.9%	79.9%	79.3%	79.1%
H.	11.5%	10.9%	11.0%	10.5%	10.2%
	99.5%	98.3%	98.3%	97.7%	97.3%
O (calc.)	0.5%	1.7%	1.7%	2.3%	2.7%
H:5C		8.2	8.3	7.9	7.7

Analysis of oxidation products soluble in ether.

Ash	2.0%	2.6%	1.7%	3.0%	2.1%
C. S.	5.5%	5.2%	5.6%	5.3%	5.2%
C.	78.3%	77.3%	78.2%	77.4%	77.2%
H.	10.8%	10.4%	10.7%	10.3%	10.2%
	96.6%	95.5%	96.2%	96.0%	94.7%
O (calc.)	3.4%	4.5%	3.8%	4.0%	5.3%
H:5C	8.3	8.1	8.2	8.0%	7.9

Analysis of oxidation products insoluble in ether.

Ash	—	—	1.3%	1.6%	0.9%
C. S.	—	—	5.9%	6.1%	6.0%
C.	—	—	76.1%	75.5%	75.1%
H.	—	—	10.6%	9.8%	9.3%
	—	—	93.9%	93.0%	91.3%
O (calc.)	—	—	6.1%	7.0%	8.7%
H:5C	—	—	8.4	7.8	7.4

These results permit the following conclusions to be drawn:

1. Ether-soluble and insoluble oxidation products both show a percentage of combined sulfur, which is somewhat lower than that of the extracted rubber. Apparently the decrease in the quantity of combined sulfur is due to the treatment with alcoholic potash.

2. The oxygen content of the ether-soluble oxidation products varies from 3.5 to 5.3%. At best these figures indicate a very slow increase of the oxygen content of the products with increasing oxidation of the rubber during aging. However, the quantity of the oxidation products increases until products insoluble in ether appear.

3. The oxidation products insoluble in ether have a higher content of oxygen than the ether-soluble. Consequently an increase in the oxygen content is noticeable here also.

4. If the ratio of hydrogen to carbon in the extracted rubber is expressed at H:5C, one finds a gradual decrease of this value, which is of great theoretical importance. Although we shall not go into this matter in detail, the following remark may be made.

If the oxygen is attached to a double bond on oxidation, then the ratio H:5C should remain constant. The gradual decrease of the ratio H:5C indicates that the hydrogen is partly removed during oxidation, and probably escapes as water. This theory is in complete accord with the findings of Kirchhof[12], who showed conclusively fifteen years ago that a considerable quantity of water escapes during the oxidation of vulcanized rubber. It may be remarked that this water formation is easily explained by Wieland's oxidation theory[13], according to which the essential feature of oxidation is an activation of hydrogen. It is our opinion then that hydrogen is activated to form water, while, apparently at the same time, a condensation process[14] occurs giving rise to oxidation products, possibly with oxygen atoms as bridges.

An accelerated aging test (Geer-Evans) was made with vulcanized rubber to learn if these oxidation products are formed as on natural aging. A compound consisting of 92.5 parts F. L. sheets and 7.5 parts sulfur was cured in sheets 1 mm. thick for three hours (combined sulfur 5.2%), and aged in a Geer oven at 70° C. for increasing periods of time. The samples were analyzed in the manner previously described. The results are given in Table IX.

Table IX

COMPOUND: F. L. SHEET EXTRACTED: 92.5 PARTS; SULFUR, 7.5 PARTS; COMBINED SULFUR, 5.2%. TIME OF HEATING AT 70°C.

	0 hrs.	72 hrs.	168 hrs.	336 hrs.
Increase in weight	.....	1.2%	2.7%	4.0%
Organic acetone extract	0.5%	3.3%	5.0%	4.5%
Combined sulfur	5.2%	6.0%	6.5%	6.6%
Alcoholic potash extract	1.2%	6.5%	7.0%	9.8%
Oxidation products, ether soluble	0.6%	5.6%	4.9%	7.6%
Oxidation products, ether insoluble	0.0%	0.0%	6.0%	trace?
Analysis of the extracted rubber.				
Ash	0.5%	0.5%	0.5%	0.5%
N.	0.4%	0.4%	0.4%	0.4%
S.	5.4%	6.2%	6.8%	6.9%
C.	81.8%	79.6%	78.8%	77.1%
H.	11.1%	10.7%	10.3%	9.7%
	99.2%	97.4%	96.8%	94.6%
H:5C	8.1	8.1	7.9	7.4
Analysis of oxidation products soluble in ether.				
Ash	2.0%	2.6%	2.9%	0.9%
C. S.	4.4%	5.0%	5.1%	5.3%
C.	79.1%	78.1%	77.5%	78.5%
H.	10.6%	10.4%	10.1%	9.9%
	96.1%	96.1%	95.6%	94.6%
O.	3.9%	3.9%	4.4%	5.4%

In the accelerated aging tests the ether-soluble oxidation products formed have an oxygen content, 3.9 to 5.4%, similar to that of the products formed on natural aging. The sulfur content again is somewhat lower than that of the extracted rubber, but increases with increasing cure. The H:5C ratio falls off slowly. Therefore in the accelerated aging test we have exactly the same process as in natural aging.

The same compound was hung up in the window in the sunlight, and after 10 and 18 days the oxidation products were determined, isolated and analyzed. The results confirmed the previous findings. The oxygen content of the ether-soluble oxidation products varied from 4.1 to 4.6%, and after 18 days there were formed 4.5% of oxidation products insoluble in ether, which contained 6.0% of oxygen.

It was evident that the oxidation products themselves are oxidizable. Those obtained from vulcanized rubber that had been given an accelerated aging test of 168 hours at 70° C. (See Table IX) were kept four weeks in diffuse daylight at room temperature. The oxygen content was then found to have risen markedly, in the case of the ether-soluble products (C. S. 5.1%) from 4.4% to 11.3% and in the case of the ether-insoluble products (C. S. 6%) from 8.5% to 13.3%.

It may be remarked that these oxidation products behave like vulcanized rubber which has the same percentage of combined sulfur and which also is very susceptible to oxidation. Whether oxidation products with a lower sulfur content also oxidize quickly has not been investigated. The difficulty is that such products are obtained in quantities too small for satisfactory elementary analysis.

Application to the Testing of Rubber Goods

The important discovery that during the first stages of oxidation the oxidation products in the alcoholic potash extract increase sooner and more rapidly than the acetone extract may be developed into a very important method of testing rubber goods. In the State Rubber Research Institute at Delft the determination of the oxidation products in the alcoholic potash extract has been often employed during the last few years in establishing the quality of rubber goods. We intend to publish the data collected in more detail, but for the present we may mention a few important points and give examples thereof.

1. In general it may be said that when the percentage of oxidation products is high the quality of the article is low. Thus for example in the specifications for rubber insulation it was prescribed that the oxidation products in the alcoholic potash extract should not exceed 0.8%. This requirement will be considered conclusive in the new Dutch specifications to be published shortly.

2. In general a connection will be found between the quantity of oxidation products and the physical properties. When the percentage of oxidation products is rather high, the physical properties are usually unsatisfactory. A few examples are given in Table X.

3. If an increase in oxidation products occurs on aging in the Geer oven at 70°C. it can be maintained that the rubber article will soon succumb to increasing oxidation on natural aging. Here, too, the increase in oxidation products is accompanied by a deterioration of physical properties. The same is true of the steam test which is applied to steam hose. Table X contains some of the results.

Table X

RELATIONSHIP BETWEEN THE PERCENTAGE OF OXIDATION PRODUCTS AND THE PHYSICAL PROPERTIES OF SOME MECHANICAL RUBBER GOODS

	Air brake hose cover		Compressed air hose cover		Steam hose cover	
	Before aging	After 7 days at 70° C.	Before aging	After 7 days at 70° C.	Before steam test	After 40 hrs. at 4 atm.
Organic acetone ext. 7.9%	8.3%		2.9%	2.9%	4.4%	6.9%
Alc. potash ext. 5.2%	5.7%		0.9%	1.3%	1.0%	3.8%
Oxidation products 3.9%	4.4%		0.4%	0.7%	0.2%	2.3%
Tensile in kg/qcm 48	40		99	78	148	37
Elongation at break in % 150	120		355	260	488	220

The air brake hose even before aging showed a high percentage of oxidation products, and the physical properties before aging were correspondingly unsatisfactory.

The compressed air hose showed a low percentage of oxidation products, which increased but little on aging in the Geer oven. Likewise the physical properties remained satisfactory.

The steam hose before steaming had a low percentage of oxidation products and likewise excellent physical properties. In the steam test the hose was subjected to a steam pressure of 4 atm. for a period of forty hours. After this test, which corresponds to service conditions, the percentage of oxidation products had greatly increased, and the physical properties had greatly deteriorated. Therefore this hose promised unsatisfactory service.

Especially in the case of rubber articles whose physical properties it is difficult or impossible to determine, the percentage of oxidation products and the increase on artificial aging is an appropriate means of determining the quality of the rubber. Likewise in the Bierer-Davis bomb test, which is rapidly being adopted, the increase in oxidation products will probably be a much more sen-

sitive measure of artificial aging than the increase in the acetone extract, which has always been determined. Experiments in this direction are under consideration and will be carried out shortly.

Résumé

A method has been worked out for isolating the oxidation products in the alcoholic potash extract of vulcanized rubber. It is shown that, during the initial stages of oxidation, the percentage of oxidation products increases much more rapidly than the acetone extract, and that therefore this fact is to be considered a very important chemical aid in studying oxidation in its initial stages. On further oxidation, oxidation products are formed which are insoluble in ether.

Systematic experiments were carried out on the formation of these products during vulcanization and during the oxidation occurring on aging.

The oxidation products formed during vulcanization and during natural and accelerated aging were carefully analyzed. The carbon and hydrogen were determined by the precise method of Heslinga, while the oxygen was determined by difference. It was found that the oxygen content of the ether-soluble oxidation products was between 4% and 5%, while that of the products insoluble in ether was between 7% and 8%.

Some theoretical considerations were mentioned, and finally the importance of determining the oxidation products in establishing the quality of rubber goods was pointed out, and several examples given.

Notes

[9]Ter Meulen and Heslinga, *Neue Methoden der organischchemischen Analyse*, **1927**, 7 (Leipzig, Akad. Verlags-Ges.).
[10]*Ind. Eng. Chem.* **14**, 139 (1922).
[11]*Trans. Inst. Rubber Industry*, **3**, 203 (1927).
[12]*Kolloid-Z.* **13**, 49 (1913).
[13]*Handbuch der Biochemie des Menschen und der Tiere*, 2nd Ed. **1925**, II, 252.
[14]It may be remarked that this condensation does not occur due to the influence of sulfuric acid, as similar oxidation products are found in raw rubber on oxidation.

Anaconda Zinc Oxide

THE Anaconda Zinc Oxide Department of the International Lead Refining Company is now manufacturing Red, Green and White Seal French Process zinc oxides, pharmaceutical zinc oxide, and also selected and lead free grades which are of particular interest to the rubber trade. In addition, this organization sells the output of basic carbonate of white lead of the Anaconda Lead Products Company, East Chicago, Ind.

Three sales offices are now maintained for the distribution of these products, the general office being at East Chicago, Ind. The district office at Akron, O., is in charge of L. G. Duncan, and another district office at 25 Broadway, New York City, is in charge of D. M. Tobey. The company has agents in Philadelphia, Baltimore, Louisville, Cincinnati, St. Louis, Kansas City, Fort Worth, Dallas, Denver, Seattle, San Francisco, Los Angeles and Portland, Ore. In Canada agents are maintained at Toronto and Montreal. Warehouse stocks are also maintained in the cities having agents, as well as Brooklyn, Newark, Boston, Indianapolis, Minneapolis, and St. Paul.

It was late in 1921 that F. O. Case and G. S. Brooks of the Anaconda organization started up a pilot plant for the manufacture of zinc oxide at East Chicago. Details were worked out on this unit, and in the spring of 1922 a large unit was designed and built at the same location. Further work was carried out and it was decided to erect a plant at Akron, O. The first unit was constructed in the last part of 1922 and began operation the following year. Also in 1923, a large furnace was built at each factory, thereby increasing production to 60 tons per day at each of the two plants. All of these units were of the French process type.

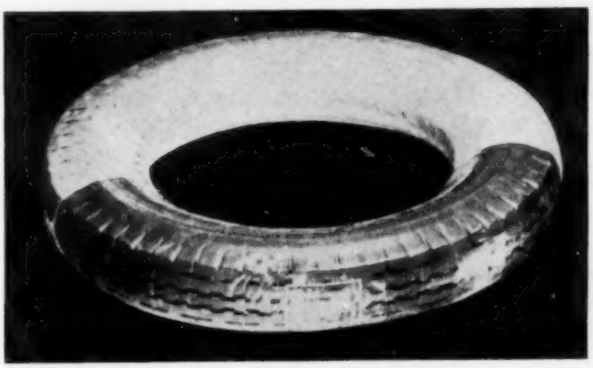
In 1925, an American process unit was erected at Akron. This has since been enlarged, and some of the experimental parts have been replaced by permanent steel, sheet iron and concrete construction.

Cellophane Wrapping on Tires

A NEW form of tire covering is being adopted by at least two tire manufacturers for their super or de luxe brands of tires, by using Cellophane as a wrapper below the outside kraft paper wrapper.

The General Tire Company is now using this Cellophane wrapping on their Super-Dual 8-ply balloon tire—a tire that sells at approximately $60.

The Swinehart Tire & Rubber Company is also doing the same with their Imperial custom built tire. Both of these



The transparent wrapping completely covers the tire. The overlaying kraft paper wrapper has been partly removed

casings are essentially quality products and the companies have adopted transparent Cellophane coverings to give these tires a finishing touch to indicate their highest grade product.

The wrapping is made with two-inch Cellophane with an overwrap of kraft paper which can be removed by the dealer and the tire placed on display in its transparent covering. In addition to the inference of high quality, the transparent wrapper protects the tire also in that it allows the individual tread, as well as the name, number and embossing to be seen at a glance. When the tire is sent out it is washed in a glycerin solution to give it a glossy appearance and should the tire be rolled around without any covering in the display room it will naturally pick up dust and become dirty very easily. The Cellophane wrapping prevents this.

Captax Output Increased

THE addition to the plant manufacturing Captax, made in April by the Goodyear Tire and Rubber Company, Akron, O., increases the plant capacity from 300,000 to 450,000 pounds per month. Another plant is being rushed to completion which will give an additional capacity of 300,000 pounds per month. This plant, which is expected to be ready within 60 days, is entirely apart from the present building and gives added insurance against fire hazards. The Toronto plant, which was put into operation last fall, is to be doubled as quickly as possible to increase its capacity to 150,000 pounds per month. All plants are operating at capacity including nights and Sundays. The R. T. Vanderbilt Company, New York City, are selling agents for Captax.

Dill Announces New Unit

THE new display unit being announced by the Dill Manufacturing Company, Cleveland, contains a representative assortment of fast selling tire valve parts, enabling small or large dealers to keep a complete stock of these Dill products out where his customers may see them. The new unit sells to dealers for $9.95.

MOLDS

The essentials in making satisfactory tire molds are accuracy in following specifications—careful attention to details—and expert workmanship.

This organization can guarantee you satisfactory service on every requirement of your mold orders.

Our experience, modern plant and skilled mechanics can serve you to excellent advantage.

Let us quote on your requirements. In placing data with us for quotation you may be sure that every confidence will be respected.

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East Exchange at Annadale
AKRON OHIO

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—Improved Vulcanized Quality
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Trenton Representative
F. V. Bechtel
289 North Willow St.

Warehouse Deliveries from All Agencies

EDITORIAL COMMENT

Inventory Control in Rubber Footwear

CONTROL of inventories of finished goods in the rubber footwear industry presents many problems which are not present in other branches of the industry. The first consideration is the fact that merchandise is manufactured a long period in advance of its actual purchase by the consumer. Secondly, the ultimate demand is an uncertain factor as it depends upon the weather to a large degree. Finally, stock control records are difficult to keep with accuracy due to the infinite variety of the product; a variety which has been extended since the introduction of novelty factor which carries along with it the style hazard.

It is refreshing to note, therefore, that two large agencies, the Rubber Association of America and the United States Department of Commerce have recently taken steps to assist the industry materially toward obtaining better control of finished goods inventory. The fact that one large manufacturer has a huge carry-over on a certain type of gaiter, for example, may not seem to affect the other producers particularly. But it does affect them as many have realized during the last year. No matter how earnestly management desires to co-operate in an instance of this kind, an excessive inventory is a condition which must be liquidated, particularly in footwear. If the goods are to be carried over another year, which is necessary in the case of gaiters in the storehouse in March, there is not only the risk of obsolescence but also that of deterioration as well as the heavy carrying charges. This makes at-once liquidation a virtual necessity, and it does not make any difference whether the goods are classed as seconds, jobs, or closeouts, every unit sold decreases the demand by exactly that amount. With monthly figures showing dealers and manufacturers stocks, however, the manufacturer has a guide as to what kind of goods to produce during the stock making season without upsetting market conditions.

The Rubber Association survey which has already been started, will show monthly production, sales, and inventories of rubber footwear by various classes such as boots, pacs, lumbermens, heavy gaiters, novelty gaiters, gum shoes, and tennis. This is easily compiled and will give producers an excellent index on conditions in the industry.

The Department of Commerce survey, which will show dealers stocks throughout the country, tennis at November 1st which is the end of the canvas season, and waterproof footwear in March which is the end of the rubber season, will be a much more complicated and difficult undertaking. Rubber footwear is marketed through many different agenices, for example, shoe stores, department stores, sporting goods dealers, country general stores, mail order houses, and chain stores. Aside from the stock carried by direct company branches which would be included in the Rubber Association figures, jobbing houses particularly in the south and west carry sizeable stocks. The method which the Government proposes to pursue is to use the mailing lists of two of the largest companies for a list of dealers. These are to be used confidentially and checked one against the other to eliminate duplications. As these lists not only contain customers but prospects, it should make the survey fairly complete.

It will be interesting to follow the results of these surveys and to observe in them the beneficial results which they have engendered.

The Saturation Point Myth

THERE seems to be considerable apprehension among British tire dealers as to whether the saturation point in the British tire market will not be speedily reached. They particularly point to the establishment of American manufacturing plants in the United Kingdom and argue that the American factories there must turn out a minimum number of times per day in order to meet running expenses and that the market for tires is not expanding rapidly enough to keep up with production.

How often has this same pessimistic cry been heard in the United States. Not only have our tire industry looked fearfully at what they deem a rapidly saturating market but there have been several instances when there have been grave shaking of heads over the ever increasing automobile output. But no such point of saturation has been reached. On the contrary, new avenues both in the domestic and export fields have developed to call for an even greater production. When the British Isles have been thoroughly saturated with tires, these American plants in Great Britain can still serve the growing markets of the Empire. The fears of the British tire dealers are probably prompted more by the inroads made into their own trade by the new American tires than by any thing else.

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

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BardoL
Compound 58900

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We will be glad to send samples or have our representative call to give further details.

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NATIONAL QUALITY

NEWS of the INDUSTRY

Financial—Business
Building Operations
Personals
New Products

OAK RUBBER COMPANY IS DAMAGED BY $5,000 FIRE

An explosion of the carbon disulfuride and sulfur chloride tank on the second floor of the Oak Rubber Company factory at Ravenna, O., caused a blaze that swept through part of the plant to cause a loss estimated at $5,000. The explosion and fire, which occurred on the afternoon of April 17, caused practically the entire plant to be closed down for several days while repairs were made, but operations have now been resumed in every department.

When the tank burst, several men were working in the room. Nearly all were thrown to the floor, but were uninjured and escaped from the department before the fire and deadly chloride gas could overpower them. The local fire department had several streams of water playing into the blaze within a few minutes, but it was impossible to fight the fire at close range because of the waves of gas fumes. It required two hours to extinguish the fire completely.

Officials of the company have not yet ascertained the cause of the blast, according to Paul Collette, secretary and treasurer. The company's first factory was completely destroyed by fire several years ago with a loss of thousands of dollars.

STUDY TEMPERATURE IN THE TESTING OF RUBBER

Through its research associate, F. E. Rupert, the physical testing committee of the Rubber Division of the American Chemical Society has conducted a series of tests at the Bureau of Standards, Washington, D. C., in an attempt to determine the effect of temperature and humidity control in rubber testing. An extension of this investigation is now in progress at the Bureau.

The part of the investigation of samples subsequent to vulcanization proved that variations in temperature which may occur from day to day in an uncontrolled testing-room may affect the physical tests to the same extent as a 25 to 40 per cent change in time of cure. The relative humidity affects the results in only a minor degree.

Lambertville Plant Sold

The plant of the Lambertville Rubber Company, Lambertville, N. J., has been purchased by Dr. Peter C. Fireman, president of the Magnetic Pigment Company, Trenton, N. J., for a sum reported to be approximately $100,000. The plant, which has been closed for more than a year, is to be reopened shortly for the manufacture of rubber boots and shoes, with about 400 workers employed. The factory had previously been purchased by a group of Trenton business men at a receiver's sale.

Leaves U. S. Rubber Plant After 61 Years' Service

The closing down of the L. Candee & Company plant at New Haven, Conn., by the United States Rubber Company has meant the termination of 61 years of service and the automatic retirement of Clarence G. Ames. Mr. Ames started working in the Candee plant in May, 1868, serving successively as head of the ticket office, in charge of the making department, assistant superintendent, superintendent, and in recent years as head of the order and shipping department has been contact man between the factory and the sales department.

Before Mr. Ames began his service in the company's employ, his mother was employed there for 50 years and his father helped to install the first piece of machinery in the original New Haven plant. F. B. Davis, Jr., president of the United States Rubber Company, wrote Mr. Ames a personal letter at the end of his period of service, expressing the company's satisfaction in his record.

FORM BUXBAUM COMPANY TO MAKE TIRE PATCHES

The A. Buxbaum Company has been formed at Akron, O., for the manufacture of a line of high quality tire patches, boots, reliners and other repair materials. The former plant of the Star Rubber Company has been acquired, and the new company has already begun manufacturing operations there.

A. Buxbaum, who has been associated with the Leo Meyer Company of Akron in the same line of business for the past 14 years, has left the presidency of that firm to organize the new company under his own name. D. Lindquist and W. L. McLaughlin, also of the Leo Meyer Company, are associated with Mr. Buxbaum in the new enterprise.

Hood Pays Dividends

The Hood Rubber Company on May 1 paid the regular quarterly dividends of $1.75 on the preferred and $1.87 on the preference stocks of the company. Checks were sent out to all stockholders of record as of April 27.

HOOD RUBBER COMPANY TO HAVE CANVAS SHOE WEEK

The Hood Rubber Company, Watertown, Mass., will hold its annual National Canvas Shoe Week from May 27 to June 8. Dealers will be asked to make a special drive on canvas rubber soled shoes by displaying them in their store windows and interiors, as well as advertising them in their local newspapers. The Hood Rubber Company is supplying window dressing material and newspaper matrices.

Dealers are invited to enter Hood's National window contest by sending a photograph of their window display and proofs of their newspaper advertising to the company's office. Fourteen prizes for various classes of dealers will be awarded, the first prize in each class being $100 and the second prize $50. There are seven different classifications, comprising stores from the smallest town to the largest city.

KEYSTONE'S UNPAID TAXES ARE PLACED AT $458,000

Schedules in bankruptcy filed in federal court April 30 by the Keystone Tire & Rubber Company, New York City, which was adjudged bankrupt on February 14, disclosed that the United States Treasury Department was the largest creditor, with a claim for $450,117. This sum is due on taxes for the years 1917 and 1918, plus penalties for non-payment.

The company was also indebted to the New York State Tax Department in the sum of $5,327 for franchise taxes covering the years 1926 and 1927, and $2,800 for similar taxes during the year 1928. Other claimants are Johnson & Shores, with $10,000 for legal services; George A. Dorman, president of the company, whose services are listed at $6,575; William H. Lofink with a claim of $3,246; and the Gryphon Rubber & Tire Corporation for $9,099.

The firm's assets are placed at $12,831, the main item being accounts payable of $12,713. The Keystone Tire & Rubber Company, with a factory located in the Kingsbridge section of New York City, formerly manufactured tires and tubes under the brand names of Keystone, Savoy, Metropolitan and Tension Tested.

Trent Factory is Sold

The Capital Rubber Company, Trenton, N. J., manufacturers of druggists' sundries, has purchased the plant of the Trent Rubber Company in the same city through the Mechanics National Bank, which held an equity on the Trent company. The price was not disclosed, but the holding price for the factory was believed to have been $100,000. The Trent Rubber Company went into receivership several years ago.

National Rubber Machinery

The National Rubber Machinery Company reports for the quarter ended March 31 a net income of $163,129 after depreciation and taxes, equivalent to $1.55 a share on the outstanding common stock. This compares with $104,872, or $1 a share, in the corresponding quarter of 1928.

Samson Profits Show Gain

The Samson Tire & Rubber Corporation in a preliminary report estimates that net earnings for the quarter ended March 31 were about 90 cents a share on the 165,000 common shares outstanding, or at an annual rate of about $3.60. The company reported $2.51 a share earned in 1928, after inventory adjustments. Sales for 1929 are estimated at more than $10,000,000, or 33 per cent ahead of last year's sales.

H. H. Robertson Moves

The H. H. Robertson Company, manufacturer of Paradura and other rubber chemicals, has moved its main office to the Grant Building, Pittsburgh, Pa. The company was previously located in the First National Bank Building in that city.

Seeks American Representation

F. W. Emil Spardel, Hasselbrookstr. 122/124, Hamburg 23, Germany, has patented a rubber article for women's use which he desires to have manufactured in the United States by an American rubber manufacturer under a licensing agreement. Further particulars may be obtained from him at the above address.

WITCO GREATLY ENLARGES CENTURY CARBON COMPANY

An important enlargement of the manufacturing facilities of the Century Carbon Company is announced by Robert I. Wishnick, president of Century Carbon Company, and president of Wishnick-Tumpeer, Inc., which owns the former company.

R. I. WISHNICK

A strict insistence upon uniformity of quality in Carbon Black has led the Century Carbon Company to restrict its output in ratio to the production of its own natural gas wells. Now further access to a gas supply of 3,000 acres in a solid block of proven gas acreage in the Richland, La., field, conceded to be the largest gas field in the world, permits of expansion in accordance with the policy of the company.

Four new units of 32 houses each, with a gasoline extraction plant, will add 10,000,000 pounds annually to the production.

Litchfield Is Honored

P. W. Litchfield, president of the Goodyear Tire & Rubber Company, has been named as one of the 18 new directors of the Chamber of Commerce of the United States at the sessions of that body in Washington, D. C. He will represent the fifth election district, composed of Ohio, Indiana, Michigan and Kentucky. The choice of Mr. Litchfield gives Akron representation on the board of the national chamber for the first time since 1914, when F. A. Seiberling, president of the Seiberling Rubber Company and then president of Goodyear, was a director.

C. P. Hall Moves

Announcement has been made of the removal of the offices of the C. P. Hall Company at Akron, O., to 504-505 Akron Savings & Loan Building, effective May 1. The telephone number of the company remains unchanged as Main 3340.

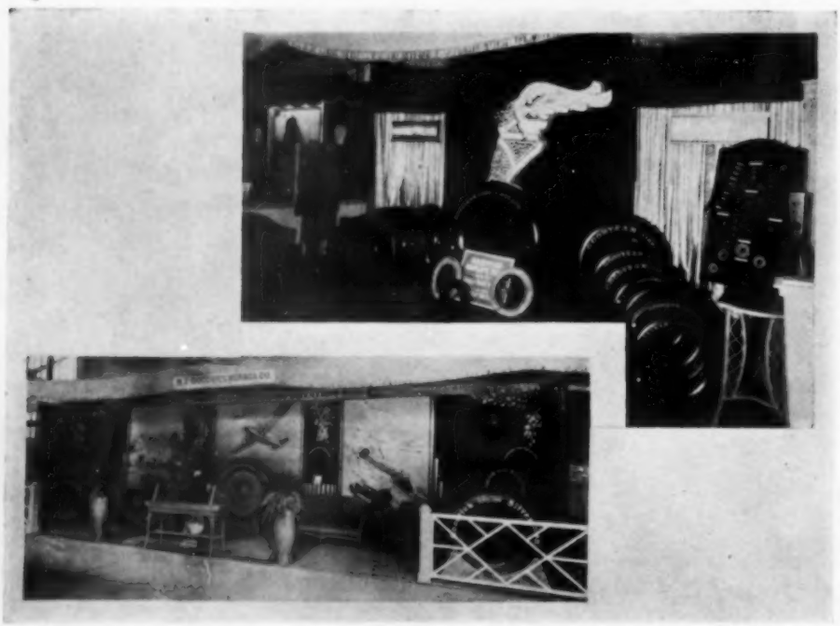
TRADING TREND MIXED IN RUBBER COMPANY STOCKS

Stocks of the leading rubber companies on the various exchanges showed no general trend during the past fortnight, 15 issues falling off in price and 9 issues closing higher. Eight stock issues declined to new low levels for the year, and one, the Firestone Tire & Rubber Company, rose 50 points to a new high of 309, receding 20 points in the final days.

Reorganization plans of the United States Rubber Company contributed to a rise of 3⅜ points in the common stock and 1⅜ in the preferred shares. Not only did Hood Rubber Common sink to a new 1929 low, but the company's bonds also reached their lowest points in the past two weeks. The 5½ per cent issue dropped to 70 and the 7 per cent issue declined to 87⅝.

Among the stock issues not listed below, the American shares of the Pirelli Rubber Company of Italy on the New York Stock Exchange showed greatest gains. Upon news of the company's favorable earnings report, these shares have risen in recent weeks from a low of 50½ to 65, but dropped back in the closing days to 60¾.

Rubber Exhibits at the Aviation Show



THE exhibits of the Goodyear Tire & Rubber Company and the B. F. Goodrich Company attracted much favorable comment at the second annual All-American Aircraft Show at Detroit last month. In the Goodrich display, the various stages of transportation in America were depicted as a background for the exhibit of Silvertown airplane tires and accessories. The Goodyear booth showed a full line of tires and other rubber aeronautical equipment and featured two airplane tires used by Art Smith during the San Francisco world fair.

Late Stock Prices

	Last Price May 3	Apr. 19	High —1929—	Low
Ajax	7½	8	11¼	7½
Falls	5	6¾	11⅝	5
Faultless	32½	35⅝	39⅞	32½
Firestone	289	259	309	220¼
do. 6% pfd.	109½	108¾	111	108¼
Fisk	11½	11¾	20⅛	10⅞
do. 1st pfd.	58	60	82½	58
General	285	290	298	236
do. pfd.	99½	100	102	99½
Goodrich	84½	85⅜	105⅜	83⅝
do. pfd.	113	113¾	115½	113
Goodyear Com.	134	130⅝	154½	112
do. pr. pfd.	103⅜	104	104⅞	101¾
Hood	20	—	27¼	20
India	60	60¼	73	39
Intercontinental	9⅜	9¼	14¼	8¾
Kelly Springfield	17⅝	16¾	24	11
do. 1st pfd.	—	—	100	88
Lee	18½	18⅞	25	17¾
Miller	23¼	24⅜	28¾	22½
do. pfd.	72½	76	83	70¼
Mohawk	58	61	66	53
do. pfd.	85	85	90½	81
Norwalk	4¼	—	6¼	3⅝
Seiberling	47½	48¾	65	47
do. pfd.	106½	106	107⅞	105
U. S. Rubber	57¼	53⅞	65	42
do. pfd.	83	81¼	92½	77

Names in the News

C. E. BISHOP, well known reclaimed rubber engineer, is now plant manager of the Akron Rubber Recovery Company, Englewood Avenue, Akron, O.

IRA WILLIAMS, formerly of the Grasselli Chemical Company Laboratory at Cleveland, O., is now located at the Jackson Laboratory at P. O. Box 525, Wilmington, Del. The Grasselli company was recently acquired by E. I. du Pont de Nemours & Company and all activities transferred to Wilmington.

JOSEPH A. ANDREOLI, export manager of the India Tire & Rubber Company, sailed with Mrs. Andreoli on the S. S. America April 30 for a four-month business tour through Europe during which he will visit 19 countries. This is Mr. Andreoli's twentieth visit to Europe in the past 15 years.

M. LLOYD SMITH, business editor of *Time*, a weekly news review, predicted a bright future for the rubber industry in an address before the members of the Akron Rotary Club at the Hotel Portage in that city on April 23. "Production is no longer the centre of interest," he said in his talk. "The big companies have got it down to a mere matter of mechanics. Merchandising is the big thing now."

P. W. LITCHFIELD, president of the Goodyear Tire & Rubber Company, spoke on April 20 on the radio program sponsored by the Akron Chamber of Commerce over station WADC. His subject was "Dirigibles."

CHARLES E. WAGNER, export manager of the Miller Rubber Company, returned to Akron April 19 after an eight-month trip through Europe in which he visited 18 countries. He declared on his return that Europe is recovering remarkably from its post-war difficulties and that there is a new era of prosperity in industrial countries. Mr. Wagner has announced his resignation from the Miller company to take effect when a successor is named.

HORACE T. COOK, president of the Acme Rubber Company and the Hamilton Rubber Company, Trenton, N. J., has been spending some time with his family in Mountain Lakes, Fla.

CLIFFORD H. OAKLEY, president of the Essex Rubber Company, Trenton, N. J., is one of the delegates of Trenton Council, Boy Scouts of Americ a, who will attend the Scout convention in New York City on May 13 and 14.

WADE MILLER, southwest division manager of the Goodyear Tire & Rubber Company, was the principal speaker at a meeting at 145 Goodyear dealers from Missouri, Arkansas, Kansas and Oklahoma, held last month at the Connor Hotel, Joplin, Mo. He described new methods of tire service and discussed Goodyear's activities in the aircraft industry.

JOSEPH O. BAUR, secretary of the Thermoid Company, Trenton, N. J., recently gave a talk on "The Making of Brake Lining" before the members of the Trenton Rotary Club.

WILLIAM A. HOWELL, superintendent of the Whitehead Brothers Rubber Company, Trenton, N. J., recently completed 50 years with that concern. Mr. Howell, in addition to still being active in this business, maintains a deep interest in civic affairs in Trenton.

CLARENCE A. BROWN resigned last month as executive vice-president of the Kelly-Springfield Tire Company to accept the position of chairman of the board of the Corn-

Photo Blank-Stoller

C. A. BROWN

stalks Products Company, Inc., manufacturers of paper pulp from farm waste material. Mr. Brown had been executive vice-president of the Kelly-Springfield organization 1914.

LIEUTENANT COMMANDER JOHN FARNSWORTH, formerly of the United States Navy, has joined the airship operations of the Goodyear Tire & Rubber Company and the Goodyear-Zeppelin Corporation as a pilot. He holds both lighter-than-air and heavier-than-air pilot's ratings and becomes Goodyear's seventh dirigible pilot. Lieutenant Commander Farnsworth entered Annapolis in 1911, was in the destroyer service during the war, and had command of a destroyer prior to entering aviation in 1919. He later was graduated from an aviation engineering course at Massachusetts Institute of Technology and organized the first air squadron at the Naval Academy.

F. A. SEIBERLING, president of the Seiberling Rubber Company, was a speaker before a meeting of 4,000 members of Fifty-Year Club of Akron at the local armory on April 13. The occasion was the first anniversary of the founding of the club, membership in which is open only to those who have been residents of Akron for at least half a century.

GENERAL J. CASANAVE and LIEUTENANT ENGINEER PAUL DUBAN, military and naval attaches respectively at the French Embassy at Washington, visited Akron on April 17 as guests of the Goodyear-Zeppelin Corporation and the Goodyear Tire & Rubber Company. Accompanied by WILLIAM C. YOUNG, head of the Goodyear aeronautic department, they inspected the construction work on the $2,500,000 hangar that will house the two giant dirigibles to be built for the United States Navy.

ROBERT STEWART, former assistant superintendent of the Goodyear Tire & Rubber Company's Devon mills, has been appointed superintendent of Goodyear Clearwater mill No. 2, now being constructed at Rockmart, Ga. Mr. Stewart who has been with the Goodyear organization since 1925, will be succeeded at the Devon mills by PAUL OSTRANDER, who has been connected with Goodyear since his graduation from college in 1922.

F. J. MCCAMMON, for 12 years connected with the Goodrich organization, has been appointed manager of the Oakland, Cal., branch of the Pacific Goodrich Rubber Company. He joined the Kansas City office of the company in 1917 and since then has been connected with practically all the departments of the firm.

A. H. PATTENDEN has resigned from the the position of electrical engineer of the eastern and western plants of the Domion Rubber Company, Ltd., and has accepted the appointment of industrial engineer of the new business department of the Montreal Light, Heat & Power Consolidated at Montreal, Que.

W. J. MILLER, formerly president of the Northwestern Steel & Iron Company, Minneapolis, Minn., was recently appointed vice-president of Foote Brothers Gear & Machine Company, Chicago, Ill.

A. G. MCINTOSH has resigned as factory manager of the Taunton Rubber Company, Taunton, Mass. He formerly was with the Boston Rubber Shoe Company and the Tyer Rubber Company, Andover, Mass.

FRANCIS P. HARRINGTON, accessory sales manager of the General Tire & Rubber Company, addressed members of the advertising class of Akron University on the evening of April 1. "Direct Mail Advertising" was the subject of his talk.

L. S. BYE, formerly advertising manager of the Falls Rubber Company, Cuyahoga Falls, O., is now an assistant organization director of the National Tire Dealers' Association. He has been working in Ohio up to the present time and is now in Kentucky.

Rubber News Around the World

RUBBER INSTITUTION HOLDS ANNUAL DINNER

Addresses by Leaders in the Industry Feature Seventh Yearly Affair of the British Institution.

THE seventh annual dinner and dance of the Institution of the Rubber Industry was held in London on April 25 at the Hotel Cecil. Lord Colwyn, the president, was in the chair.

Sir George Beharrell, president of the Society of Motor Manufacturers and Traders and managing director of the Dunlop Rubber Company, proposed the toast of the Institution, remarking that during the year its membership had grown from 1,068 to 1,180, and its diploma members have increased from 160 to 280. The qualification by examination is very strict and is keenly sought after, the institution placing education first as its one main objective, he said. It cooperates with other bodies in many ways, and one of the most hopeful and interesting signs, according to Sir George, is the Manchester Rubber Trade School, which will be opened in July. He expressed his hope that one of the first acts of the new government will be to introduce a Rubber Bill, so that research work in connection with the industry will be encouraged.

Lord Colwyn replied, and the toast of "The Allied Associations," proposed by Hugh C. Coles, chairman of the council, was responded to by Ernest Leete, chairman of the Cable Makers' Association.

H. Eric Miller, past chairman of the Rubber Growers' Association, in submitting the toast of "The Guests," said that what manufacturers and growers wanted was to be able to buy and sell rubber at a stable and reasonable price. Field Marshal Sir William Robertson replied.

Sir Stanley Bois, in proposing the toast of "The President," said that from present signs all connected with the industry could look for a long time to come to a very reasonable price for the raw material which was being produced in the East at the cost of the sweat and brains of the Britisher. He expressed the hope that the happy relations established in the trade during the last decade would long continue.

Canadian Goodrich Expands

The Canadian Goodrich Company, Ltd., has awarded the contract for the building of the proposed four-story addition to its factory at Kitchener, Ont., to Dunker Brothers of the same city. The new addition will be 60 by 90 feet in size and will cost approximately $100,000.

Metcalf Heels, Ltd., to Build

Metcalf Heels, Ltd., Preston, Ont., is planning the construction of a plant for the manufacture of rubber heels. Contracts are now being arranged for the construction and equipment of the factory, which is estimated to cost about $25,000.

American Tires in Spain

The entrance to the establishment of Ernest Breto at Barcelona, Spain, showing a window display of United States tires. This dealer's shop is typical of the better class Spanish distributors of American tires.

COMPARES RUBBER PLANTS IN ENGLAND AND AMERICA

Herbert Rogers, director of the Northern Rubber Company, lecturing to the London and District Section of the Institution of the Rubber Industry last month, said that mass production and the employment of labor and time saving devices were what most impressed him about the rubber industry in America during his recent visit. In some phases of preparation and manufacture, he declared the United States was a long way behind England, while in others the position was reversed.

"A feature of the American rubber factories is their cleanliness," he stated. "Americans go to great lengths to keep dust away from the goods. In one factory I noticed that instead of the usual brick walls coated with whitewash, they were coated with aluminum paint so as not to attract any particles of dust."

Plan Brazilian Tire Plant

Tires and tubes will be manufactured in Brazil close to the heart of the crude rubber plantations, according to an announcement made by the Pan American Union on April 22. A sum of $30,000 represents the initial outlay for building and equipping a rubber factory at Belem, a city of 236,000 population, at the mouth of the Amazon River and almost on the equator. No mention has been made of the identity of the organization behind the project.

LARGEST CEYLON ESTATE REPORTS LOWER PROFITS

The report of the Grand Central (Ceylon) Rubber Estates, the largest producer of rubber in Ceylon, discloses a reduction of 62 per cent in profits for 1928, the net income being £75,319 against £198,254 the previous year. The average annual price at which the company has sold its rubber has declined from 2s 3.32d in 1926 to 11.62d for 1928, and this has been the principal cause for the fall in profits.

The dividend rate has been reduced from 12½ per cent to 5 per cent, but the directors were able to add £5,000 to reserve and to carry forward £43,268. No estimate is given of the probable crop in 1929, but it is announced that forward contracts have been entered into aggregating 395 tons at 9.66d, London, and 600 tons ex godown Colombo at ¾d per pound under the London average price for the month preceding delivery, subject to a maximum of 1s 1¼ d per pound and a minimum of 7¼d per pound. A further 60 tons have been sold c.i.f. Marseilles with a maximum of 1s 2½d and a minimum of 8d.

GOODYEAR OF AUSTRALIA SHOWS PROFIT FOR 1928

The Goodyear Tyre & Rubber Company (Australia), Ltd., in its second year of trading has shown a net profit of £117,571 for the twelve months ended December 31, 1928, as against a loss of £38,754 for the preceding year. After deducting a debit balance of £44,573, which included 8 per cent preference dividend for the six months ended June 30, 1927, preference dividends for the 18 months to December 31, 1928, absorb £35,079, leaving a surplus of £37,919.

The ratio of current assets to current liabilities as of December 31 was 2.8 to 1, according to the directors' report. It is stated that by careful buying the company was able to restrict its losses when the rubber market collapsed during the first few months of 1928. In order to provide equipment and facilities to meet the sales demand, factory building floor space has been increased 80 per cent.

CATALPO
for
Footwear

Rubber Goods and Specialties

Tire Repair Material

A recent addition to the tire repair material line of the General Tire & Rubber Company, Akron, O., is this long wearing stock of low specific gravity, introduced under the name of "Supreme" Camel Back. It contains no reclaimed rubber, according to the manufacturers, and is furnished in

all sizes necessary for tire repairmen. It comes packed in a strong individual container with instructions showing recommended cures. In connection with its tire repair material line, the General Tire & Rubber Company is distributing among its dealers three-color fibre signs and other advertising material.

Ear Stopple

Under the name of the Fitsrite ear drum protector, this item is being manufactured and distributed by the Fitsrite Products Company, 23 East 22nd Street, New York City. It is made of pure, soft white rub-

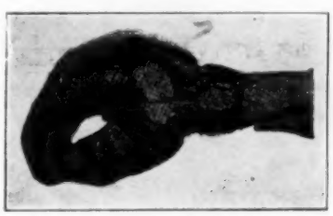
ber and is claimed to give adequate protection to the ear for swimmers, divers, aviators and others who need such a safeguard. These ear stopples are attractively packed with either one or two dozen to a display card and are sold to retail at a low price. The display card makes a handsome counter advertising exhibit and, according to the manufacturers, is already helping to make heavy sales in drug stores, sporting goods stores and other outlets.

Golf Club Grip

An addition to the line of golf club grips manufactured by the Avon India Rubber Company, Ltd., 343 Euston Road, London, England, is this Whitcombe grip, designed and used on his clubs by Ernest Whitcombe, the well known British professional golfer. It is claimed for it that it is non-slipping in wet weather and that it does not chafe the hands. The Avon company is one of the largest manufacturers of tube grips for golf, cricket, tennis and other sports, making these items in an extensive range of patterns and colors. The company also produces golf balls and various sundries for the sport, such as tees, sleeves and ball cleaners.

Pneumatic Boxing Glove

D. J. Kennedy, 130 Seminary Avenue, Yonkers, N. Y., is manufacturing a boxing glove that is said to give 100 per cent protection to boxers in training. The patented construction of this pneumatic glove



with its rubber bladder is such that it is impossible for it to lose its original shape, as there is no cotton or hair filling to become compressed or pushed out of shape, leaving the knuckles exposed. A similar glove was patented by the same manufacturer several years ago, but since that time many new features have been added and the perfected glove, under new patents, is now being marketed. The inventor is also working at the present time on a pneumatic baseball glove.

Cushion Top Table

Designed for use in drug stores, confectionery shops and tearooms, a new type of Seatmore luncheonette table is being offered by Frank Rieder & Sons, 407-419 Brown Street, Philadelphia, Pa. The new tables are provided with a cushion top of colored and resilient rubber. This top material is said by the manufacturer to be impervious to moisture, in addition to making service silent and cutting down breakage of glassware. It is extremely durable and, of course, will not chip or crack in the manner of ordinary top materials. These tables are available for delivery in three standard color combinations—green verdi antique, black and gold, mottled green and white—and in nine other color combinations by special order.

Elbow Pad

The purpose of this rubber elbow pad is to protect the elbow of shooting coats or regimental tunics where it is necessary to rest the elbow on damp ground or rough walls or butts in shooting. It is manufactured and distributed by the North British

Rubber Company, Ltd., Castle Mills, Edinburgh, Scotland, the largest rubber shoe manufacturer in the United Kingdom. This company also produces waterproof garments and covers for the implements used in connection with sports, such as capes, hoods, fishing trousers, bathing caps, etc.

Automatic Golf Tee

To enable golf to be practiced without the need of placing the ball by hand on a tee, or in fact handling the ball at all, the Ever Ready Golf Tee Company, 329 High Holborn, London, England, is offering this automatic golf tee. It is in the shape of an oblong box which is sunk flush with the ground level. The magazine of the box holds ten balls which are fed through the round hole at one extremity. On depress-

ing the rectangular platform at the other extremity with the head of a club and then allowing it to return to its normal position, a ball is automatically placed on the tee ready for driving. The special tubular tee is made of the most flexible rubber tubing and is designed to stand prolonged use, as it does not suffer from the most violent strokes.

It is held in position by a single screw, which makes replacement the work of but a few moments. Another screw enables the tee to be adjusted to any convenient height, while the strength of the return spring may be adjusted similarly. It will be seen that all the balls may be teed up in succession and driven off without the player having to bend down to make tees or to place the ball on a ready-made tee. The manufacturer would like to license an American factory to make the device in this country.

Current Crude Rubber Items

PRICES CONTINUE LOW ON RUBBER EXCHANGE

Volume of Transactions in April Total Only 19,339 Lots Against 26,243 Lots Sold on the Exchange During March.

TRADING on the Rubber Exchange of New York, Inc., was less active during the past fortnight and tended to hold down the total volume for the month of April. During the entire past month, only 19,339 lots, equivalent to 48,347.5 tons, were sold, as compared with a volume of transactions in March of 26,243 lots.

Price quotations continued low, and on only one day in the course of the past two weeks did the spot price rise above the 20-cent mark. During the last two days of April, prices dropped to their lowest point, May rubber being quoted on both days as low as 19.20 cents a pound.

Slight Rally at Close

Aggressive support on the part of a leading manufacturers' representative, coupled with week-end covering, made for a temporary price advance at the close of the period. As a result of this buying on part of trade factors, the active months rose 30 or 40 points on the final day, while some of the 1930 positions improved a full half-cent over the closing levels of the previous day. This rally, while likely to continue for another day or so, was not expected to last much longer, due to the number of trade interests anxious to sell. The advances, moreover, were scored in the face of slightly easier cables from London, where the spot position reverted back to 10d bid.

The table below gives the daily fluctuations in prices of the Exchange and the daily volume of sales.

Colwyn Sees Co-operation As Rubber's Only Hope

"Absolute combination and cooperation are the only hope we have of success in industry," declared Lord Colwyn, speaking as chief guest of the India Rubber Manufacturers' Association at its annual luncheon in Manchester.

"The coal trade, with which I am associated," he continued, "has been in a state of thorough disorganization because of the selfishness and suspicion that permeate the men engaged in it. The same causes have been at work in the rubber industry. That suspicion and the fear of one another are causing us both dismay."

NEW MEMBERS ADMITTED TO RUBBER EXCHANGE

During the past month the Rubber Exchange of New York, Inc., has admitted four new members, and in the same period two names were dropped from the list of active members. The newly admitted members include Robert G. Dale, Andean Trading Company, New York City; Ernest H. Vogelsang, Rhd. Siedenburg & Company, New York City; John G. Stoller and W. E. Fouse of the General Tire & Rubber Company, Akron, O.

The names of Carroll V. Geran and C. F. McPhillips, the latter of the Andean Trading Company, have been dropped from the list of active Exchange members. The Rubber Exchange has also asked its members to add to the list of co-partnerships the name of Ernest H. Vogelsang of Rhd. Siedenburg & Company.

PLANTATION STOCKS ARE ADMITTED TO N. Y. CURB

The New York Curb Exchange on April 18 admitted to unlisted trading privileges Guaranty Trust Company of New York American depository receipts for ordinary registered shares, par value £1, of the Malacca Rubber Plantations, Ltd., and the Rubber Plantations Investment Trust, Ltd. This is the first time that trading has ever been conducted on the New York Curb Exchange in British rubber producing companies.

The two companies are both well rated among British rubber estates, each having been active in the industry for 20 years and each having fair earnings and dividend records. Since their admission to the New York Curb, there has been moderate trading in each at prices in the neighborhood of $9 a share.

A few months ago it was rumored that the Rubber Exchange of New York, Inc., was considering the organization of an affiliated securities exchange to permit trading in this country in the issues of rubber producing companies. No further announcement has been made since that time, and it is believed that the proposal did not meet with general approval with the members of the exchange.

New Merger Reported

It is reported that the shareholders of the Thirumbadi, Kinalur, Kuttiadi, Pudukad and Eddiyanna rubber estates have received details of evaluation of their companies, respectively, and that an amalgamation scheme is now being worked out. Proposals are said to be at the confidential stage between Pierce Leslie & Company, of Madras, and the respective shareholders.

Ecuador Production Halted

A report from Guayaquil, Ecuador, states that since the end of the Stevenson Act restrictions on Malayan rubber, the production of rubber in Ecuador has been at a standstill. Exports to the United States during 1928 were declared at only 67,800 pounds as against 790,172 pounds in 1927.

O. D. HARGIS, general manager of the Sumatra plantations of the United States Rubber Company, has returned to America for a few months' leave. He was in New York City recently to consult with officials of his company, but will spend most of his leave at his ranch in Texas.

Closing Prices on Rubber Exchange of New York, Inc.

FROM APRIL 20 TO MAY 4, 1929

		Spot	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Sales*
Apr.	20	19.50	19.60	20.00	20.20	20.40	20.60	20.60	20.70	20.80	20.80	20.90	21.00	——	286
	22	19.10	19.60	19.80	20.10	20.30	20.40	20.60	20.70	20.70	20.90	21.00	21.10	——	946
	23	20.20	20.30	20.60	20.80	21.10	21.20	21.30	21.40	21.50	21.70	21.80	22.00	——	856
	24	19.50	19.70	20.00	20.30	20.50	20.60	20.70	20.80	20.90	21.00	21.20	21.30	——	837
	25	19.40	19.40	19.70	20.00	20.20	20.30	20.40	20.50	20.60	20.80	20.90	21.00	——	831
	26	19.40	19.60	20.00	20.30	20.50	20.60	20.70	20.80	20.90	21.00	21.00	21.30	——	714
	27	19.40	19.60	19.90	20.20	20.30	20.40	20.60	20.80	20.90	21.10	21.20	21.30	——	98
	29	19.30	19.30	19.60	19.90	20.10	20.20	20.40	20.50	20.60	20.70	20.90	21.10	——	326
	30	19.50	19.50	19.90	20.20	20.30	20.40	20.50	20.60	20.80	21.00	21.20	21.30	——	514
May	1	19.70	19.70	20.00	20.30	20.50	20.60	20.70	20.80	20.90	21.10	21.30	21.40	21.50	398
	2	19.40	19.40	19.70	19.90	20.10	20.20	20.30	20.40	20.50	20.70	20.90	21.60	21.10	503
	3	19.70	19.70	19.90	20.20	20.30	20.60	20.70	20.80	20.80	20.90	21.10	21.20	21.30	518
	4	19.90	19.90	20.20	20.50	20.70	20.80	21.00	21.10	21.20	21.40	21.60	21.70	21.80	285

*In lots of 2½ tons each

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Frank B. Wilson

Frank B. Wilson, purchasing agent of the Lee Rubber & Tire Corporation, Conshohocken, Pa., died suddenly at his home in that city on April 20. He had been associated with the Lee organization for 12 years

and in that time had attained wide recognition throughout the rubber industry. Executives and officials of the Lee Rubber & Tire Corporation and the Lee Tire & Rubber Company were present at the funeral services.

Charles Dean Bonney

Charles Dean Bonney, factory manager of the E. H. Clapp Rubber Company, Hanover Mass., died April 15 at the Robert Brigham Memorial Hospital, Boston, in his 62nd year, after a brief illness. Funeral services were held from his late home at South Hanover on April 18 and were largely attended by his many friends among the rubber trade and townspeople.

Charles D. Bonney was born in Pembroke, July 8, 1867, son of John D. Bonney and Clara M. Bonney, his ancestry going back to Thomas Bonney, a Doxgury settler in 1640. He received his early education in the schools of Pembroke and later attended Hanover Academy. On August 26, 1890, he married Etta M. Stetson of Pembroke, who survives him. The following year he entered the employ of the Clapp Rubber Company whom he served continuously for thirty-eight years, being made factory manager seventeen years ago. He was widely known in the industry for his engineering and mechanical ability, and adapted many machines from other industries for use in reclaiming. He also served as historian of his company and carefully preserved the records of its growth dating back to 1869, when the late Eugene H. Clapp first started to reclaim rubber by the mechanical process.

Raleigh Bullard Adams

Raleigh Bullard Adams, technical superintendent of the Stowe and Woodward Company, rubber manufacturers of Newton Upper Falls, Mass., passed away suddenly April 14, at the Newton Hospital in his 75th year. Funeral services were held at St. Paul's Episcopal Church, Newton Highlands, on April 17.

Mr. Adams was graduated from the Massachusetts Institute of Technology in 1894 and shortly afterwards entered the employ of the Boston Belting Company where he served for many years as superintendent. with Stowe and Woodward Company and About ten years ago he became associated broadened their line to include covering rubber rolls, in which he was a specialist of the greatest skill.

He is survived by his wife, Margaret, his mother, Ellen, a sister, Mrs. Holden of West Roxbury, and a brother, Henry Saxton, of Forest Hills, Mass.

Fisk Gets Tax Refund

The Fisk Rubber Company was included in the first seven income tax refunds made public under the new policy ordered by President Hoover and announced by Internal Revenue Commissioner Blair. A refund of $216,269.90 was paid to the Fisk company on its 1920 return, the internal revenue bureau having determined that "the inventory valuation of 1920 was materially overstated in the tax return."

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for
Frictions

DU PONT COMPANY EARNS $23,847,677 IN QUARTER

The report of E. I. du Pont de Nemours & Company for the first quarter of 1929 shows $23,847,677, or $2.42 a share, earned on the 9,838,675 shares of $20 par common stock, as against $20,304,487, or $2.18 a share, earned during the first three months of last year on 9,315,803 shares. The increase in shares outstanding represents shares issued in connection with the consolidation with the du Pont company in December, 1928, of the business of the Grasselli Chemical Company.

Eaenings from operations alone for the first quarter of 1929, including the business of the Grasselli Chemical Company, were $7,442,844, as compared with $3,977,713 for the first quarter of 1928, an increase of $3,465,131, or 87 per cent. The majority of the company's other earnings were derived from its General Motors investment.

Dayton Not Invited to Sue

In a news article on page 77 of the April 25 issue of THE RUBBER AGE, it was stated that the Dayton Rubber Manufacturing Company said in its suit against the Allis-Chalmers Manufacturing Company that the defendant had invited it to bring suit to test out the validity of the Geist patent. J. A. MacMillan, president and general manager of the Dayton company, declares that this is erroneous, and that, on the contrary, his firm challenged Allis-Chalmers to bring such a suit about a year ago.

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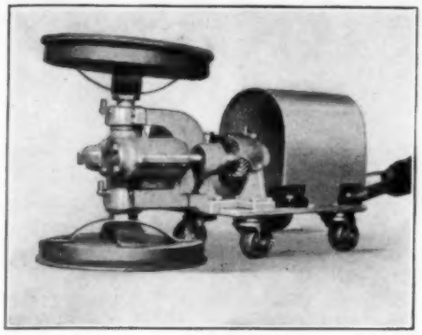

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LATE MARKET PRICES

Crude, Scrap & Reclaimed Rubber - Cottons and Fabrics

NEW YORK, MAY 4, 1929

COTTON

TRADE reports during the past fortnight were somewhat less encouraging and resulted in the price quotations declining approximately a half a cent a pound in most of the future positions. Labor troubles, particularly in the South among the textile workers, are partially responsible, one dispute arising as fast as one is settled. Mills are finding it increasingly difficult to obtain a worthwhile margin of profit, and foreign spinners have curtailed their operations with a resultant falling off in exports. The continued failure of the Reparations Committee to come to an agreement may further aggravate the situation.

Opinion in the United States is divided on the present position of the 1929 crop, but the majority believe that the outlook is good. Less re-planting has been necessary than for several seasons, while the weather has been unfavorable only in scattered sections. However, the weather during the next few months and the weevil and other insects may affect the final outcome.

High, low and closing prices quoted on May 4 were as follows:

	High	Low	Close	Close
	May 4			Apr. 19
May	19.70	19.53	19.65	20.15
July	—	—	18.91	19.48
Sept.	19.00	19.00	19.06	—

Tire Fabrics

Tire fabrics sold in moderate volume during the past fortnight, smaller orders being the rule toward the end of the period as compared with some of the larger lot business done in the earlier weeks of April. Combed Egyptians were reported on a few sales of fair size, but the bulk of the business was in carded peeler cords of American cotton. Prices were fairly steady and closed the second week unchanged as follows:

CORD			
Peeler, carded, 23/5/3	lb.	.47½@	.48½
Peeler, carded, 23/4/3	lb.	.48½@	.49½
Peeler, carded, 13/3/3	lb.	.45 @	.45½
Peeler, carded, 15/3/3	lb.	.45½@	.46
Egyptian, carded, 23/5/3	lb.	.54 @	.54½
Egyptian, combed, 23/5/3	lb.	.58 @	.59
CHAFERS			
Carded, American, 8 oz.	lb.	.40½@	.41½
Carded, American 10 oz.	lb.	.41½@	.42½
Carded, American, 12 oz.	lb.	.41½@	.45
Carded, American, 14 oz.	lb.	.40 @	.46
LENO BREAKER			
Carded, American, 8¼ oz.	lb.	.41 @	.46
Carded, American, 10¼ oz.	lb.	.41 @	.46
SQUARE WOVEN			
Carded American, 17¼ oz. 28-11 ply	lb.	.47 @	.48
Carded American, 17¼ oz. 10-ply	lb.	.40 @	.41

Sheetings

Sheetings closed the fortnight with very few sales having been reported.

40-inch, 2.50-yard	yd.	@	.12½
40-inch, 2.85-yard	yd.	@	.11
40-inch, 3.15-yard	yd.	.11⅛@	.11⅝
40-inch, 3.60-yard	yd.	@	.09½
40-inch, 3.75-yard	yd.	@	.08½
40-inch, 4.25-yard	yd.	.07⅝@	.07½

Ducks

Cotton ducks sold in somewhat better quantities during the past two weeks, with trading volume rather heavier in the second week than at the beginning of the period. Prices were somewhat easier, with numbered ducks, enameling ducks, and some of the B grade single filling ducks selling on a lower basis. The bulk of sales were in these goods, with some lighter business done in belting ducks, where a basis of 38 cents a pound was the fairly firm market value.

Belting and Hose	lb.	@	.38
Enameling	lb.	.35 @	.36
Single filling	lb.	.14¾@	.16½
Double filling	lb.	.17½@	.18½

RECLAIMED RUBBER

A bulletin has been issued by the United States Department of Commerce, based on the 1927 biennial census of manufactures, which would show that the degree of completeness of reclaimed rubber consumption figures of the Rubber Association of America have a degree of completeness of only 70.2 per cent. According to this computation, the 1928 absorption of reclaim in the United States was 223,000 tons as compared with the figure of 200,200 tons previously estimated. On the other hand, these government calculations would reduce the 1928 consumption of crude rubber to 437,000 tons and thus make the ratio of reclaim to crude 51 per cent instead of 45.4 per cent as previously figured.

High Tensile			
Super-Reclaim No. 1 Black	lb.	.13 @	.13½
Super-Reclaim No. 2 Black	lb.	.12 @	.12½
High Tensile Red	lb.	.13 @	.13½
Shoe			
Unwashed	lb.	.07¼@	.07½
Washed	lb.	.10 @	.10¼
Tube			
No. 1 (Floating)	lb.	.14 @	.14½
No. 2 (compounded)	lb.	.11 @	.11½
Tires			
Black, washed		.09⅝@	.10¼
Black, unwashed		.08 @	.08½
Black, selected tires	lb.	.08½@	.09
Dark Gray	lb.	.10 @	.10½
Light Gray	lb.	.12 @	.12½
White	lb.	.13 @	.13½
Truck, Heavy Gravity	lb.	.07 @	.07¼
Truck, Light Gravity	lb.	.07½@	.07¾
Miscellaneous			
Mechanical Blends	lb.	.07 @	.07½
Red	lb.	.12½@	.13

Scrap Rubber

Lower prices than have prevailed over the first three months of the year are still continuing in the scrap rubber market. Both tire and boots and shoes are still low.

(Prices to Consumer)

Auto tire peelings	ton	42.50	@45.00
Standard White auto	ton	47.50	@50.00
Mixed auto	ton	26.00	@27.00
Bicycle tires	ton	20.00	@22.50
Clean solid truck tires	ton	22.00	@24.00
Boots and shoes	cwt.	1.45	@ 1.50
Arctics, untrimmed	lb.	.00⅝@	.00⅞
Inner tubes, No. 1	lb.	.07½@	.07¾
Inner tubes, No. 2, compounded	lb.	.04¼@	.04⅝
Inner Tubes, Red	lb.	.05⅛@	.05⅝
Air Brake Hose	ton	34.00	@35.00
Rubber Hose	ton	17.50	@20.00

CRUDE RUBBER

ONLY one day during the past fortnight has seen crude rubber quoted above 20 cents a pound in the New York outside market. The average closing spot price for the month of April was 21.18 cents a pound, but this was brought up by the higher price range during the first half of the month. However, it compares favorably with the average of only 18.97 cents a pound for April, 1928.

At this time of the year, one British authority remarks, it may prove worth while to bear in mind that the prevailing tendency of the price curve for rubber during the last 15 years has been downward from April onward to August. The statistics of the moment, the size of the American tire inventories, the rate of production of cars during the last five months and the general economic prospects for the summer do not point to the likelihood of the current year's price curve deviating from this general tendency.

The New York market, however, has lapsed into a state of dullness, due mainly to the lack of any aggressive buying. Bearish interests are progressing cautiously in view of the broadening buying power noticeable on minor depressions. The final day saw a short rally that was attributed to week-end covering and the aggressive support of one manufacturer's representative. Because of this temporary advance, which is not expected to hold, the closing prices were a full half-cent above those quoted at the end of the previous fortnight.

Prices on the New York outside market on May 4 were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-May	.20	@	.20¼
June	.20⅛	@	.20⅜
July-Sept.	.20⅜	@	.21
First Latex, crepe spot	.20½	@	.20¾
Amber Crepe, No. 2	.18⅝	@	.18⅝
Amber Crepe, No. 3	.18¼	@	.18⅜
Amber Crepe, No. 4	.17⅞	@	.18¼
Brown Crepe, Clean, thin	.18¼	@	.18⅜
Brown Crepe, specky	.17⅞	@	.18¼
Liquid Latex, per gal.	1.00		
Paras—			
Up-river Fine	.21½	@	.21¾
Up-river Medium	Nominal		
Up-river Coarse	.12¼	@	.12½
Acre Bolivian, fine	.22	@	.22¼
Caucho Ball, Upper	.12¼	@	.12½
Islands, fine	Nominal		
Centrals—			
Central, scrap		@	.12½
Esmeraldas		@	.12½
Balata—			
Block, Colombia	Nominal		
Block, Ciudad	.54	@	

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Spot-May		@	10 d
June-Sept.	10⅛	@	10⅜d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot		@	9⅜d

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LATE RUBBER CHEMICAL PRICES

Accelerators — Colors — Softeners — Compounding Materials

NEW YORK, MAY 4, 1929

GOOD demand still prevails for all standard brands of rubber chemicals and compounding ingredients, and no changes in price quotations have been recorded. Consumption of rubber chemicals during the first four months of 1929 has been approximately 25 per cent higher than for the corresponding months of last year, and there is no sign of any appreciable slackening up in this heavy use. Work on factory expansions is continuing and, while these new additions will soon be adding to the present production volume, it is not believed that the supply will be greater than the rapidly increasing dmand.

Manufacturers of rubber chemical supplies are unanimous in holding that the present season is the best in their history for sales volume and profits. Several have developed new products in recent months, and both these and their staple lines are selling well.

ACCELERATORS

Organic			
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
Aero-X	lb.	.60 @	.65
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.15 @	.16¼
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolylguanidine	lb.	.42 @	.52
Diphenylguanidine	lb.	.30 @	.36
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde Aniline	lb.	34 @	.44
Grasselerator 102	lb.		
Grasselerator 552	lb.		
Grasselerator 808	lb.		
Grasselerator 833	lb.		
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.62½@	.65
Lithex	lb.	.18 @	.20
Methylenedianilins	lb.	.35 @	.45
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Para-Nitrosodimethylaniline, f.o.b. works	lb.	.92 @	.96
Piperidine-Piperidyldithio-Carbamate	lb.	4.45 @	4.60
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 397	lb.	.75 @	.77½
Safex	lb.	1.20 @	1.25
Tensilac, No. 39	lb.	.50 @	.52½
Tensilac, No. 41	lb.	.50 @	.52½
Thermio F	lb.	.50 @	.55
Thiocarbanilide, drums	lb.	.26½@	.28½
Thionex	lb.		
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.62½
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Waxene	lb.	.30 @	.32
Z 88	lb.	.50 @	.60
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.10½@	.12½
Litharge, domestic	lb.	.09 @	—
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.35 @	.40
Ultramarine	lb.	.06 @	.30
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.27 @	.31
medium	lb.	.28 @	.31
dark	lb.	.31 @	.34
Chromium Oxide, bbl.	lb.	.31 @	.38
Reds			
Antimony crimson, 15/17	lb.	.44 @	.50
sulfur free	lb.	.52 @	.60
golden 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.12
Domestic (Maroon)	lb.	.08 @	.12
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Venetian red	lb.	.03 @	.06
Vermillion, quicksilver, English	lb.	1.95 @	—
Whites			
Lithopone, Akcolith	lb.	.05 3/5@	.06
Lithopone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanox	lb.	.09½@	.10
Cal. Base Pigment	lb.	.10 @	.10½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.06⅞
Zinc Oxide—French Process			
White seal	lb.	.11⅜@	—
Green seal	lb.	.10⅜@	—
Red Seal		.09⅜@	—
Yellows			
Chrome	lb.	.16½@	.17
Ocher, French medium	lb.	.02 @	.03
domestic	lb.	.01⅞@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate	lb.	.10½@	.12
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color,	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Blacks			
Arrow "Aerfloted"	lb.	.08½@	.12½
Bone Black	lb.	.07 @	.08½
Carbon, compressed	lb.	.08½@	.12½
Carbon, uncompressed	lb.	.08 @	.12
Drop Black	lb.	.06 @	.10
Fumonex	lb.	.06 @	.09
Gastex	lb.		
Lamp Black	lb.	.12 @	.40
Micronex	lb.	.09 @	.13
Velvetex carbon	lb.	.04½@	.06
Blanc fixe dry f.o.b. works	lb.	.03½@	.03⅝
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk	ton	12.00 @	14.00
Clay, China, domestic	ton	8.00 @	9.00
Aerfloted Suprex	ton	10.00 @	22.00
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Mineral Flour, c. l. fob mine	ton	20.00 @	23.00
Tensulite		15.00 @	—
Glues, extra white	lb.	.22 @	.26
medium white	lb.	.20 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, powdered	ton	65.00 @	80.00
Rotten Stone (powdered)	lb.	.02½@	.04½
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.30 @	3.70
Talc, domestic	ton	12.00 @	15.00
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.50 @	—
Superfine	ton	10.00 @	12.00
Witco	ton	12.00 @	—
Wood pulp XXX	ton	45.00 @	—
Wood pulp X	ton	25.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.24 @	.25

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Montezuma, solid	ton	28.00 @	36.00
Montezuma, granulated	ton	32.00 @	42.00
Paradura	ton	62.50 @	65.00
Pioneer, MR, solid	ton	42.00 @	45.00
Pioneer-granulated	ton	52.00 @	55.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 60 degrees	ton	10.50 @	11.50
66 degrees	ton	15.00 @	16.00
Tartaric, crystals	lb.	.37 @	.38
Acids, Fatty			
Stearex	lb.	.15½@	.20
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.40 @	
Oils			
Corn, refined, bbls.	lb.	.11 @	.11½
Cottonseed, crude		.08½@	.08¾
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c. l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05 @	.06
Hexalin	lb.	.60 @	—
Acetate	lb.	.70 @	—
Linseed, Raw C.L. bbl.	lb.	.09½@	.10
Palm Lagos	lb.	.07¼@	.07½
Niger	lb.	.07¾@	.08
Vansulol	lb.	.10½@	—
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
dark amber	lb.	.03¾@	.03⅞
Pine, steam distilled	gal.	.65 @	.70
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	9.00 @	10.00
Rosin, grade K, 280 lb. bbl.		8.55 @	—
Pigmentar	gal.	.33 @	.41
Solvenol, drums	gal.	.45 @	.50
Tarol, drums	gal.	.30 @	.35
Tar Retort, 50 gal.	bbl.	12.50 @	13.00
Solvents			
Acetone, pure	lb.	.13 @	
Alcohol denatured, No. 1 bbls.	gal.	.37½@	.44½
Benzol, 90%	gal.	.28 @	—
Carbon bisulphide	lb.	.05½@	.06¼
Carbon tetrachloride	lb.	.06¼@	.07
Motor gasoline, steel bbls.	gal.	.17 @	—
Naptha, solvent	gal.	.35 @	.40
Turpentine, spirits	gal.	.60 @	.64
wood	gal.	.50 @	.54
Waxes			
Beeswax	lb.	.56 @	.58
Carnauba	lb.	.33 @	—
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.07 @	.07½
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c. l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.03¾@	
White crude scale 124/126	lb	.04 @	
Refined, 125/127	lb.	.05¾@	
Refined, 128/130	lb.	.05½@	
Refined, 135/137	lb.	.07¾@	
Refined, 138/140	lb.	.08¼@	
Miscellaneous			
RSL Mold Solution	gal.	.75 @	1.00

ANTI-OXIDANTS

Albasan	lb.	.70 @	.75
Antox	lb.		
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.64 @	—
VGB	lb.	.55 @	.66

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03¼@	.03½
Sulfur flour,			
Refined, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags)	cwt.	1.75 @	2.10

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

NET imports of crude rubber into the United States during the first three months of 1929 totaled 161,597 long tons as against net imports of only 104,937 long tons in the first quarter of 1928. During this period, consumption has risen from 103,558 long tons in 1928 to 129,326 long tons in the first quarter of the present year. The apparent surplus of imports over consumption, however, has been adequately balanced, due to the shortage of stocks in America at the end of 1928, and March, 1929, closed with 157,012 long tons on hand and afloat to this country as compared with 153,385 long tons a year previous.

Nevertheless, fear of heavy unrestricted production in the Far East has held down the price of crude rubber. A sharp decline during April forced the New York price down from 23 cents a pound at the beginning of the month to 19¾ cents on the closing day. This compares with the high for the current year of 26½ cents reached at the end of February and with the average for the first quarter of 1928 of 33.27 cents a pound.

The increase in London stocks has been remarked, but the figure of 31,213 long tons toward the end of April is still far below the 53,400 long tons held at the same date in 1928. Shipments from London to the United States have practically ceased, resulting in the week-to-week gain in English stocks.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate places in the following tables.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available. The section accordingly affords the most up-to-date, complete and convenient statistical service in the industry.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10 309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1926:							
July	35,820	33,061,281	41.20	1,554	1,743,854	50.09	34,266
Aug.	27,400	24,670,752	40.21	1,318	1,339,563	45.38	26,082
Sept.	37,112	32,625,032	39.25	1,437	1,519,870	47.20	35,675
Oct.	29,746	25,320,558	38.49	1,366	1,316,270	43.03	28,110
Nov.	39,155	34,890,536	39.78	1,482	1,411,517	42.51	37,673
Dec.	37,754	33,261,366	39.33	1,904	1,841,305	43.16	35,850
1927:							
Jan.	43,340	36,753,719	37.86	1,525	1,444,734	42.28	41,815
Feb.	28,337	23,110,257	36.41	2,451	2,277,297	41.47	25,886
Mar.	35,515	28,693,016	36.07	2,763	3,249,665	52.50	32,752
Apr.	46,202	37,321,505	36.06	1,575	1,428,425	40.48	44,627
May	36,518	30,984,377	37.88	2,782	2,501,562	40.14	33,736
June	33,045	27,850,014	37.62	1,775	1,550,592	39.00	31,270
July	37,677	31,678,259	37.53	1,958	1,560,853	35.59	35,719
Aug.	32,810	26,396,931	75.92	1,809	1,382,768	34.12	31,001
Sept.	33,301	25,314,412	33.94	3,500	3,036,929	38.74	29,801
Oct.	30,184	22,163,282	32.78	2,513	2,042,713	36.29	27,67[illegible]
Nov.	28,592	27,395,428	31.69	2,469	2,014,196	36.43	36,123
Dec.	30,737	22,213,574	32.26	2,655	2,245,754	37.77	28,082
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,511	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,835	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,380,905	17.98	4,218	2,094,037	22.16	46,386
Apr.							
May							
June							

U. S. Consumption of Crude Rubber

(Rubber Association of America statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	16,938	30,106	29,058	29,638	32,196	31,518	34,403	43,002
Feb.	14,767	30,149	25,736	19,761	31,136	30,137	33,702	41,594
Mar.	21,408	36,629	28,385	33,498	32,936	36,141	35,688	44,730
Apr.	19,294	29,085	27,129	34,139	32,696	35,871	32,772	
May	23,246	36,155	25,845	35,322	29,364	34,592	37,333	
June	31,713	24,272	22,753	35,822	28,598	33,801	37,676	
July	24,522	17,685	23,396	36,053	27,577	29,219	37,407	
Aug.	29,631	20,359	28,982	35,909	34,533	33,460	42,927	
Sept.	24,410	17,594	31,497	31,691	32,904	27,214	39,882	
Oct.	26,881	21,321	31,520	29,047	29,836	26,790	40,857	
Nov.	24,950	20,437	27,289	28,853	28,080	26,792	37,461	
Dec.	25,070	31,902	27,199	28,748	26,293	25,492	31,232	
Totals	282,560	305,694	328,769	388,481	366,149	371,027	441,340	

Figures on Quarterly Basis

Quarter	1921	1922	1923	1924	1925	1926	1927	1928
Jan./Mar.			96,776	87,609	95,263	94,301	99,216	103,558
Apr./June	65,463	127,360	89,493	75,674	104,099	87,109	103,242	103,500
July/Sept.			55,621	83,813	99,493	93,793	89,210	117,573
Oct./Dec.	105,962	155,067	63,617	92,656	85,789	83,212	80,860	117,597
Totals	171,425	282,427	305,507	339,752	384,644	358,415	372,528	442,227

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
Feb. 2	9,216	1,784	2,612	23	13,635
Feb. 9	8,341	1,066	1,773	65	11,245
Feb. 16	3,771	1,648	1,982	174	7,575
Feb. 23	9,610	559	1,556	55	11,780
Mar. 2	10,200	1,510	3,744	55	15,509
Mar. 9	8,281	1,974	1,974	9	12,238
Mar. 16	7,370	572	1,977	9	9,928
Mar. 23	8,757	754	1,673	.....	11,184
Mar. 30	7,333	923	1,596	45	9,897
Apr. 6	9,234	1,037	1,975	10	12,256
Apr. 13	7,061	458	1,935	.....	9,454
Apr. 20	6,863	740	1,886	112	9,601
Apr. 27	7,808	1,212	1,723	108	10,851

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1926																																
October	48	48	—	43¼	42¾	42¾	42½	42½	42½	—	42%	42%	42½	42%	43	43½	—	42½	42%	42¾	42¾	42%	42%	—	42½	42½	42½	42¾	42½	—	—	42½
November	41¾	—	41	41¾	41½	41½	—	41½	41¾	42%	41¾	41½	—	—	40%	40%	40½	39½	38¾	39	—	38½	38	—	38½	38	—	39	38	87	—	38½
December	36¾	37½	37½	37½	—	37	—	37¾	37	37	37½	37½	—	37¾	37¾	38	38	38	—	38	38¼	38½	38½	39	—	—	39	39	38¾	38¼	—	38¾
1927																																
January	—	—	38½	39	39¼	39¾	40%	40¼	—	40½	40%	40%	40%	39%	39%	38	39¼	38¾	39	38½	38¾	38½	38%	38¾	38¾	38½	38½	38½	38	38	38	38¾
February	37¾	37¾	37½	37½	37½	—	37%	37%	37%	38	38	38¾	38¾	38¾	38	38	38¾	38¾	38¾	38¾	38½	38½	39	39	39	39	39	39½	39	—	—	38¾
March	39¾	39¾	40¾	40¾	41	—	40%	40%	40%	40%	41%	41%	41½	41½	41%	41%	41½	41½	41½	41¾	41%	41%	41¼	41¼	41¼	41¼	41¼	41¼	41	41¼	41¼	41¼
April	41¼	41¼	41	41	41¼	41¾	41%	41¾	41¾	—	41	41	40¾	40%	40%	40%	40%	40%	40%	40½	41	40%	40%	40%	40%	40½	40½	40½	40½	40½	40½	40½
May	40%	40%	40¾	40%	41	41¼	41%	40%	40%	—	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
June	40%	40¼	40%	40%	40%	40%	39½	39½	39%	—	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	41	41	41	40%	40%	40%	40%	40%	40%
July	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%
August	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½	35½
Sept.	34	33¾	33¾	33¾	33½	33½	33½	33½	33½	33½	33½	33½	34	34	34	34	34¼	34¼	34½	34½	33	33½	33¾	34¼	34¼	34¼	34¼	34	34	34	34	34
Oct.	33%	—	33¾	33¾	33½	33%	33%	33%	33%	33%	34½	34%	34%	34%	35%	35%	35%	35%	35%	35%	34%	34%	34%	34%	35	35¼	35¼	35¼	35¼	35¼	35¼	35¼
Nov.	35	35¼	35¾	35¾	36¼	36¾	38%	36%	36%	36½	36%	36%	36%	36%	36%	36%	36%	37%	37%	37%	38¼	38½	38½	38½	40	40½	41¼	41¼	41¼	41½	41½	41½
Dec.	40½	40¼	40¼	40¼	—	40%	40½	—	40	40½	—	40½	40	40	39%	40¼	40¼	40%	40%	40%	40%	40½	40%	41	40%	—	—	41¼	41¼	41¼	41½	40%
1928																																
January	—	87½	87%	41¼	41¼	—	41	—	40%	40½	40%	40%	40%	40%	40%	40¾	40	40%	40¼	40¼	40¼	—	—	40¼	40%	39%	39¾	39¼	39	38%	40¼
February	87½	87%	87%	87%	87%	86%	86%	84½	83%	83%	83%	83%	83%	83%	83%	82½	81¾	81¾	81¾	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	82%
March	29	28%	28%	28%	28%	28%	26%	26½	25¼	26¼	25¼	24¾	24¾	25¼	25	25¼	25¼	25¼	25¼	26%	26	26	26	26	27½	27¾	27%	27%	27%	27%	27%	26%
April	—	27¼	27¼	27½	21½	21¼	—	—	20	18%	18%	18%	18%	18%	17¼	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	19
May	17½	17%	18%	19%	19¼	—	18%	19%	19%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19%	19%	19%	19
June	19%	19%	—	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	20%	20	19	19%	19½
July	—	18%	18%	19%	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19½
August	19½	19½	19%	19%	19%	19%	19%	19%	19%	20	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19	19	19	19½
September	—	—	—	19	18%	18%	18%	18%	20	20	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
October	18%	18½	18½	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	19	19	19	19	19	19	19	19	19	18%	18%	18%	18%	18%	18%	18%	18%
November	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	17%	17%	17%	17%	18%	18%	18%	18%	18%	18%	18%	18%	17%	17%	17%	17%	17%	18%
December	17%	—	17%	17%	17%	17%	18%	18	—	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
1929																																
January	—	18¼	18¼	18¼	18¼	18¼	18¼	18%	18½	18%	20	20	—	20	19%	20%	20¼	20¼	20¼	20¼	20%	20½	21%	22%	22%	22	—	22½	21¾	21¾	22¼	20¼
February	22%	22	—	21%	22¼	22¼	22%	22%	22%	22%	22¼	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	—	—	26½	26¼	26¼	—	—	—	24
March	26	26	26	26	26	26	25%	25½	25½	25%	25%	24%	24%	24%	24%	24%	24%	24%	24%	23	23	23½	23¼	23¼	23¼	21¾	22½	22¼	—	—	—	24½
April	23	23¼	22¼	22%	22%	22½	22%	22%	22½	22%	22%	21%	21%	21%	21%	21½	21%	20%	20%	19%	19%	—	20%	19¾	19¾	19¾	19%	19%	19%	—	—	21½
May	19%	19%	19%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	——
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	——
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	——
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	——
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	——
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	——
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	——
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	——
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	——

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Feb.	Mar.	Apr.	May	Day	Feb.	Mar.	Apr.	May
1	11⅛	12⅞	11⅛	9⅞	17	—	—	10¼	—
2	11	13½	11¼	10	18	12½	12	10	—
3	—	—	11⅛	10	19	12½	11⅞	10	—
4	10¾	13⅛	10⅞	—	20	12⅝	11½	10⅛	—
5	11	12¾	10⅞	—	21	12½	11½	—	—
6	10⅞	12¾	11	—	22	13	11½	9⅞	—
7	10⅞	12⅝	—	—	23	13⅛	11¼	10¼	—
8	10⅞	12⅝	11	—	24	—	—	10⅛	—
9	11	12⅝	11	—	25	13⅛	11⅛	9⅞	—
10	—	—	11	—	26	13¼	11	10	—
11	11⅛	12¾	10⅞	—	27	13¼	11⅛	10	—
12	11	12⅝	10⅞	—	28	12⅞	11	—	—
13	11¼	12⅝	10⅝	—	29	—	—	9⅞	—
14	11⅜	12¼	—	—	30	—	—	9⅞	—
15	11⅞	12¼	10¾	—	31	—	—	—	—
16	12⅝	12	10⅝	—					

Average Monthly Price Per Pound

Month	1927 Pence	1928 Pence	1929 Pence	Month	1927 Pence	1928 Pence	1929 Pence
Jan.	19.410	19.310	9.942	Aug.	17.202	9.306	——
Feb.	19.021	15.713	11.875	Sept.	16.293	8.530	——
Mar.	20.125	12.736	12.135	Oct.	16.366	8.807	——
Apr.	19.897	8.864	10.490	Nov.	18.159	8.596	——
May	19.769	8.845	——	Dec.	19.690	8.570	——
June	17.880	9.293	——	Average			
July	16.770	9.312	——	for Year	18.375	10.656	——

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Apr.	May	Day of Month	Apr.	May	Day of Month	Apr.	May
1	20.75	19.55	11	20.65	——	21	——	——
2	20.75	19.65	12	20.70	——	22	19.85	——
3	20.40	19.75	13	20.75	——	23	19.85	——
4	20.55	——	14	——	——	24	20.25	——
5	20.65	——	15	20.60	——	25	19.90	——
6	20.55	——	16	20.55	——	26	19.75	——
7	——	——	17	20.45	——	27	19.85	——
8	20.65	——	18	20.40	——	28	——	——
9	20.75	——	19	20.30	——	29	19.40	——
10	20.65	——	20	20.05	——	30	19.45	——
						31	——	——

Average Monthly Price Per Pound

Month	1927 Cents	1928 Cents	1929 Cents	Month	1927 Cents	1928 Cents	1929 Cents
Jan.	18.42	19.12	20.22	Aug.	20.04	19.28	——
Feb.	14.10	18.40	20.21	Sept.	21.95	18.67	——
Mar.	14.32	19.38	20.19	Oct.	20.22	15.62	——
Apr.	14.75	20.63	20.29	Nov.	20.22	19.84	——
May	16.07	21.58	——	Dec.	19.58	20.22	——
June	16.85	21.50	——	Average			
July	18.00	21.36	——	for Year	17.49	19.97	——

Stock of Crude Rubber in the U. S.

(All Quantities in Long Tons)

At	ON HAND			AFLOAT			ON HAND AND AFLOAT		
End of	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	76,172	110,244	76,342	45,312	41,256	78,596	121,484	151,500	154,938
Feb.	91,186	108,955	90,058	42,166	43,316	63,825	133,352	152,271	153,883
March	85,740	114,061	100,536	49,600	39,324	56,476	135,340	153,385	157,012
April	92,757	113,083		38,963	33,986		131,720	147,069	
May	94,563	105,356		44,181	34,374		138,744	139,730	
June	89,250	90,198		47,233	40,001		136,483	130,119	
July	98,469	83,242		40,687	42,304		139,056	125,546	
Aug.	96,148	68,994		40,937	51,875		137,085	120,869	
Sept.	97,829	68,851		37,966	48,566		135,793	117,417	
Oct.	97,452	66,421		42,804	41,571		140,256	107,992	
Nov.	101,034	61,956		37,076	68,119		138,110	130,075	
Dec.	100,130	66,166		47,938	68,764		148,068	134,930	

(Rubber Association of America figures raised to 100%.)

Stock of Crude Rubber in London

(No. of tons in Wharves and Warehouses, including Latex)

At end of:	1921	1922	1923	1924	1925	1926	1927	1928	1929
Jan.	56,573	67,252	73,498	57,460	27,172	9,994	54,994	66,524	25,191
Feb.	59,439	67,623	70,483	56,732	23,425	10,004	58,826	62,964	25,554
Mar.	63,913	66,670	63,438	55,647	18,104	13,127	63,055	58,272	
Apr.	68,759	68,637	58,770	54,559	12,949	18,773	66,897	53,425	
May	70,403	70,146	54,439	51,615	5,895	20,384	67,169	44,628	
June	69,408	71,597	51,050	51,115	5,318	23,984	63,902	38,756	
July	71,065	71,515	49,937	52,073	4,258	27,727	63,717	35,429	
Aug.	73,211	72,112	58,427	49,700	4,619	30,165	64,491	32,084	
Sept.	72,175	70,977	54,523	44,011	5,453	35,077	68,236	31,440	
Oct.	69,229	68,536	58,891	37,523	5,086	42,138	69,569	24,207	
Nov.	70,786	68,548	60,074	33,593	3,869	44,057	67,050	17,775	
Dec.	69,792	72,299	60,246	29,488	5,697	48,918	63,793	19,815	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1928					
April	58,732	58,945	56,819	53,360	
May	52,015	50,337	48,705	44,628	
June	43,716	42,683	41,185	40,083	38,611
July	36,915	35,925	35,288	35,445	
August	34,294	33,649	32,591	32,815	
September	31,933	31,477	32,110	31,884	31,462
October	29,525	27,870	26,477	24,240	
November	22,919	21,494	20,194	18,724	
December	16,855	16,517	17,669	18,821	19,727
1929					
January	21,953	23,016	23,547	24,423	
February	25,389	25,413	24,757	25,005	
March	25,441	25,920	26,442	27,656	28,077
April	28,934	30,446	30,503	31,213	

Rubber in Singapore and Penang

(Stocks held by Dealers—Quantities in Long Tons)

End of	1927	1928	1929	End of	1927	1928	1929
Jan.	25,440	25,868	29,617	July	22,558	18,663	
Feb.	26,766	22,867	32,373	Aug.	25,764	18,971	
Mar.	27,844	20,538	29,437	Sept.	25,178	14,898	
Apr.	24,543	16,946		Oct.	25,790	12,149	
May	25,133	17,437		Nov.	28,369	29,188	
June	21,898	18,207		Dec.	25,798	32,895	

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1926	24,199,524	78.8
1924	21,863,311	19.7	1927	19,700,003	79.1
1925	26,001,664	66.8	1928	24,247,282	81.6
1928			1929		
July	2,209,692	85.9	January	1,835,207	79.4
August	2,318,898	80.2	February	2,265,024	80.8
September	2,315,604	76.9	March	2,613,389	80.4
October	2,114,611	72.2	April		
November	1,213,245	66.4	May		
December	1,101,193	74.7	June		

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1925	1926	1927	1928	1929
January	14,386,000	17,582,000	17,888,000	20,938,000	22,602,000
February	13,210,000	15,814,000	18,240,000	21,136,000	22,776,000
March	14,890,000	19,302,000	22,464,000	24,041,000	28,495,000
April	19,013,000	20,848,000	23,371,000	25,712,000	
May	20,459,000	24,213,000	26,579,000	27,355,000	
June	20,724,000	23,803,000	27,799,000	29,022,000	
July	22,879,000	24,752,000	29,784,000	30,960,000	
August	22,323,000	26,912,000	29,779,000	33,148,000	
September	20,177,000	22,929,000	28,409,000	29,691,000	
October	19,826,000	23,973,000	25,497,000	30,610,000	
November	18,024,000	20,618,000	24,400,000	26,222,000	
December	17,954,000	21,419,000	23,718,000	26,644,000	
TOTAL	223,865,000	262,165,000	297,928,000	327,932,000	

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	4,965	5,358	6,722	4,932	5,394	6,626	10,432	9,949	13,712
Feb.	5,095	6,363	6,912	4,458	5,031	5,282	11,075	11,721	15,495
Mar.	6,276	6,819		5,701	5,731		11,583	12,389	
Apr	6,299	6,178		5,701	5,812		12,122	12,717	
May	6,151	6,759		5,657	6,457		12,462	13,024	
June	6,202	6,692		6,253	7,117		12,462	12,162	
July	5,087	6,498		5,973	7,895		11,326	11,157	
Aug.	5,752	7,469		6,393	8,403		10,721	10,034	
Sept.	4,822	6,802		5,717	7,145		9,722	9,765	
Oct.	4,773	7,326		4,799	5,717		9,665	11,520	
Nov.	4,502	6,075		4,306	4,998		10,136	12,579	
Dec.	4,497	5,605		4,165	4,591		10,264	13,624	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
Jan.	5,337	5,441	6,517	6,016	6,072	7,242	15,585	12,982	15,386
Feb.	5,658	6,895	6,769	5,120	5,431	5,278	16,075	14,650	16,999
Mar.	7,184	6,231		6,157	5,731		17,096	15,573	
Apr.	7,373	6,661		6,359	5,702		17,801	16,638	
May	6,737	7,168		6,140	6,300		18,389	17,702	
June	6,306	6,953		6,832	7,136		17,858	17,159	
July	5,284	6,674		7,070	8,729		16,004	14,974	
Aug.	6,480	8,343		7,983	9,350		14,664	13,931	
Sept.	5,651	7,103		6,758	7,154		13,511	13,543	
Oct.	5,065	6,929		5,024	5,662		13,539	15,285	
Nov.	4,775	5,592		4,723	5,002		13,585	15,743	
Dec.	4,969	5,184		4,712	4,858		13,692	16,117	

(1) Rubber Association of America figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	Grand Total
1922	2,547,208	2,302,923	244,285	102,053	94,904	7,149	2,649,261
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927							
July	268,474	236,866	31,608	10,987	8,719	2,268	279,461
Aug.	308,807	274,378	34,429	12,526	10,139	2,387	321,333
Sept.	260,420	226,440	33,980	11,262	8,681	2,581	271,682
Oct.	219,712	183,041	36,671	7,791	6,236	1,555	227,503
Nov.	134,381	109,742	24,639	6,617	5,173	1,444	140,998
Dec.	133,178	105,784	27,394	3,435	2,277	1,158	136,613
TOTAL	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928							
Jan.	225,039	199,032	26,007	8,463	6,705	1,758	282,502
Feb.	323,368	290,836	32,358	12,504	10,315	2,189	335,872
March	412,825	371,408	41,417	9,724	7,478	2,246	422,549
April	409,948	364,877	45,071	24,240	20,546	3,694	434,188
May	425,990	375,798	50,192	33,942	29,764	4,178	459,932
June	396,967	356,439	40,528	28,399	25,341	3,058	425,366
July	396,445	237,933	52,512	25,226	20,122	5,104	415,671
Aug.	458,429	400,689	57,740	31,245	24,274	6,971	489,674
Sept.	413,722	358,872	54,850	21,193	16,572	4,621	434,915
Oct.	397,096	339,976	57,120	18,586	13,016	5,520	415,682
Nov.	256,936	217,256	39,680	11,769	8,154	3,615	268,705
Dec.	233,135	205,144	27,991	9,425	6,734	2,691	242,560
TOTAL	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	28,486	2,801	497,371
March	584,733	513,266	69,559	40,621	32,833	7,788	625,354
April							
May							
June							

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[4]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[4]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,505	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,601
1927:															
Mar.	41,346	17,464	23,882	7,142	1,124	997	639	432	5,657	7,004	12,905	733	3,178	1,791	65,484
Apr.	29,041	13,069	15,972	3,349	723	984	452	526	4,666	5,531	10,197	557	2,451	1,520	46,928
May	31,393	15,491	15,902	3,124	760	786	415	348	5,430	5,529	13,410	586	2,460	1,207	49,957
June	32,607	14,706	17,901	3,348	856	1,100	539	409	4,818	5,518	9,109	772	889	1,731	46,990
July	23,947	12,697	11,250	4,018	827	859	544	333	4,771	6,142	11,566	519	1,757	1,113	43,699
Aug.	30,371	17,105	13,266	5,357	688	1,133	623	546	4,355	6,682	12,440	716	1,928	969	48,703
Sept.	29,335	12,095	17,740	4,911	479	645	566	498	3,635	5,957	9,853	497	2,072	1,213	48,066
Oct.	29,846	15,801	14,045	5,245	862	721	591	542	3,810	7,755	13,633	775	2,752	939	51,520
Nov.	28,277	19,860	8,417	4,464	1,277	1,241	591	600	4,127	6,587	14,395	683	2,369	1,627	46,378
Dec.	32,185	17,865	14,320	4,130	1,395	946	592	664	5,768	7,878	13,438	1,191	3,340	1,444	55,101
1928:															
Jan.	27,789	16,618	11,171	3,830	1,605	842	581	525	4,851	7,988	11,774	1,100	2,273	1,025	47,565
Feb.	28,848	12,911	15,937	4,947	1,081	667	581	536	4,052	6,757	8,630	787	1,612	1,276	46,860
Mar.	27,879	10,508	17,371	3,683	775	645	581	269	3,999	5,825	9,690	700	2,750	1,211	47,499
Apr.	20,139	9,336	10,804	3,233	789	630	494	258	3,993	5,040	5,499	736	1,014	1,323	38,810
May	26,483	10,350	16,133	3,091	654	842	494	241	4,943	5,355	10,347	717	2,602	1,135	45,994
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,655	725	1,399	960	40,788
July	30,481	13,383	17,098	5,129	1,043	905	593	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,438	11,893	712	1,732	450	56,936
Sept.	29,769	11,239	18,530	4,675	457	938	594	447	4,956	6,536	9,363	969	1,614	494	50,073
Oct.	24,476	12,603	11,873	3,999	864	949	500*	457	5,295	7,474	10,124	513	1,399	732	44,179*
Nov.	68,135	10,436	57,699	8,005	1,048	772	500*	425	4,950	7,902	7,805	943	1,790	623	92,462*
Dec.	66,763	11,122	55,641	7,848	1,113	744	500*	294	5,120	8,792	10,896	948	2,220	588	94,704*
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	500*	461	5,640	8,067	11,076	395	2,134		
Feb.	47,926	12,103	35,823	6,943	1,117	955	500*	495	6,572	7,511	10,384	965	2,104		
Mar.	49,448	14,553	34,895	6,713		758	500*	499	5,515	6,620	10,629	741	2,332		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, and 2,439 in 1927. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, and about ½ ton in 1927. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I" are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, and 84 tons in 1927. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States*[a]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,758	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,128	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	589	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,480	2,498	2,648	172	-3,807	1,778	589	567	395,885
1923	309,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,846	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	35,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	24,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,209	1,870	618,649
1927	398,493	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	596,695
1927:															
March	32,752	9,049	2,050	3,475	3,760	1,578	852	784	780	454	86	385	137	127	56,269
April	44,627	7,875	2,310	2,393	1,509	2,181	781	1,972	762	448	58	230	177	218	65,541
May	33,736	2,896	2,006	3,380	2,519	1,084	918	997	694	626	-57	335	155	223	49,402
June	31,270	2,282	2,387	3,632	2,086	798	942	1,506	557	583	-17	243	164	183	46,616
July	35,719	1,116	2,384	2,899	2,104	1,505	1,007	415	900	429	66	227	177	236	49,184
August	31,001	3,463	2,795	3,119	2,013	1,970	1,274	386	650	604	-63	312	138	123	47,785
September	29,801	7,800	1,956	2,891	1,850	2,025	684	518	772	552	-33	451	155	272	49,694
October	27,671	5,888	3,479	4,202	1,790	1,966	1,021	1,075	908	465	156	401	153	363	49,538
November	36,123	1,687	3,661	4,209	1,916	1,575	1,167	1,312	836	749	298	474	246	317	54,570
December	28,082	309	4,696	3,108	2,302	2,710	1,462	1,453	1,242	784	-202	514	268	300	47,028
1928:															
Jan.	37,120	1,921	1,764	2,485	2,290	1,361	760	755	802	589	52	261	335	376	50,871
Feb.	30,926	3,143	2,526	2,984	2,553	1,248	437	783	616	599	98	307	296	297	46,813
Mar.	36,893	3,179	1,902	3,521	2,989	1,694	763	231	918	816	95	351	497	398	54,247
April	35,663	—2,280	2,204	2,719	1,938	2,334	1,114	1,820	832	575	280	339	304	159	48,001
May	28,660	—5,322	3,297	2,944	2,180	2,288	1,090	3,893	655	746	209	485	220	213	41,558
June	25,143	—3,031	3,597	2,968	2,186	2,102	984	4,111	348	743	133	346	251	182	40,063
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	384	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,386	2,943	3,711	1,049	98	766	696	141	527	250	318	59,346
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	689	837	544	31	337	252	282	46,938
Dec.	40,781	8,438	3,633	2,470	2,618	3,002	1,145	1,378	755	639	148	435	263	200	65,905
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481		1,061	749	218			525	
Feb.	61,331	5,179		4,613	2,908	2,727	1,259		1,131	627	113			356	
Mar.	46,391	9,068		4,586			1,515								

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. *United States imports of guayule are not included in this compilation: such imports amounted to 4,305 tons in 1926; to 5,010 tons in 1927; and to 3,076 in 1928.

BOOK REVIEWS

STANDARDS YEARBOOK. Compiled by the National Bureau of Standards, United States Department of Commerce, Washington, D. C. 1929. 408 pp.

Of particular interest to rubber manufacturers are the reports of standardizing activities of the Rubber Association of America, the Rubber Heel Club of America, the National Boot & Shoe Manufacturers Association, the Tire & Rim Association of America, the Society of Automotive Engineers and related trade bodies. Summaries of 11 varied investigations from the aging of soft rubber to the manufacture of guayule are presented under the topic heading of "Rubber." In another section it is stated that during the past year 118 endurance tests were made on various types of pneumatic tires for government agencies, 15 for states and cities, and 39 as part of co-operative investigations.

RUBBER, WITH SPECIAL REFERENCE TO THE USE OF LEAD COMPOUNDS. By J. R. Sheppard. Published by the Eagle-Picher Lead Company, Chicago, Ill. 1929. 28 pp.

This paper was originally read and discussed at the St. Louis meeting of the American Institute of Chemical Engineers and first published in Volume XX of the transactions of that group. It is copiously illustrated with figures and tables.

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	2,900	1,068,694
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,308	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928:	3,075	1,755,685	731	430,855	7,552	2,540,059	1,597	777,128
Jan.	432	242,339	27	24,218	588	183,705	150	86,702
Feb.	489	281,295	33	32,165	403	142,621	312	215,085
Mar.	575	365,927	32	26,460	829	388,616	115	57,833
Apr.	512	312,131	47	32,924	592	174,970	68	27,627
May	452	233,414	—	——	679	226,064	100	42,762
June	424	220,081	9	6,799	293	91,152	28	12,374
July	191	100,342	123	46,747	373	113,295	81	27,344
Aug.	—	——	399	165,460	451	126,962	147	60,738
Sept.	—	——	60	38,198	2,028	713,736	125	56,768
Oct.	—	——	121	59,358	429	129,065	239	94,570
Nov.	—	——	59	41,119	472	140,116	88	35,409
Dec.	—	——	83	58,311	522	156,154	145	59,911
1929:								
Jan.	—	——	46	30,374	484	152,260	138	62,950
Feb.	—	——	82	70,209	823	255,594	40	19,806
Mar.	—	——	90	75,444	428	122,026	1	1,140

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1919	81,366	73,535	36.3	.....
1920	86,395	75,297	38.4	.....
1921	36,725	41,351	24.1	.....
1922	57,834	54,458	19.3	.....
1923	74,766	69,534	22.7	.....
1927:				
Jan.	16,526	12,374	39.3	25,903
Feb.	15,860	14,424	47.8	27,291
Mar.	16,788	13,528	37.4	27,124
Apr.	14,483	16,677	46.5	25,712
May	16,159	15,754	46.1	26,419
June	16,652	15,547	46.0	25,811
1928:				
Jan.	14,862	18,134	52.7	21,941
Feb.	15,291	16,808	49.9	20,848
Mar.	17,069	18,619	52.2	19,558
Apr.	15,393	17,355	52.9	19,283
May	18,945	18,201	48.8	19,197
June	18,781	16,328	43.4	18,709
1929:				
Jan.	18,685	19,453	45.3	24,394
Feb.	18,094	17,846	42.9	23,305
Mar.	19,984	18,782	41.9	22,076
Apr.				
May				
June				

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1924	80,079	76,072	22.4	
1925	132,930	137,105	35.6	13,203
1926	180,582	164,500	45.9	23,218
1927	189,144	178,471	47.6	24,980
1928	208,516	200,200	45.4	24,785
July	15,488	13,842	47.4	26,599
Aug.	15,109	15,836	47.3	25,157
Sept.	14,392	14,790	54.3	23,429
Oct.	16,127	17,292	64.5	22,176
Nov.	15,477	14,876	55.5	21,728
Dec.	16,083	13,431	52.7	24,980
July	17,278	17,173	45.9	17,305
Aug.	19,049	15,532	36.2	15,881
Sept.	18,693	16,022	40.2	17,991
Oct.	17,182	16,587	41.7	17,026
Nov.	18,245	16,547	44.2	22,399
Dec.	17,728	12,894	41.3	24,785
July				
Aug.				
Sept.				
Oct.				
Nov.				
Dec.				

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927.

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